Site Inspection Work Plan

Circle Court Groundwater
117 Circle Court
Willow Park, Parker County, TX

TXN000606965

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VI

Prepared in cooperation with the U.S. Environmental Protection Agency

February 2010

884532

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Texas Commission on Environmental Quality
and
U.S. Environmental Protection Agency

Prepared by

Texas Commission on Environmental Quality
Preliminary Assessment/Site Inspection Program
Austin, Texas

February 2010

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NOTE

The State predecessor agencies: Texas Water Quality Board (TWQB), Texas Department of Water Resources (TDWR), Texas Water Commission (TWC), Texas Air Control Board (TACB) and Texas Natural Resources Conservation Commission (TNRCC) referred to throughout this report are now known as the Texas Commission on Environmental Quality. The new agency, TCEQ, became effective September 1, 2002, as mandated under State House Bill No. 2912 of the 77th Regular Legislative Session.

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SIGNATURE PAGE

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SECTION 1: INTRODUCTION

Under authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA), the Texas Commission on Environmental Quality (TCEQ) has been requested by the U.S. Environmental Protection Agency (EPA) Region 6 to conduct a site inspection (SI) at the Circle Court Groundwater Site (the Site) in Parker County, Texas. This SI will investigate the threat to human health and the environment posed by impacts to the Paluxy Aquifer from unknown source(s). The scope of the investigation will include collecting samples to determine type and concentrations of hazardous substances associated with the Site and collecting samples to investigate migration of hazardous substances from the Site.

Work Plan Overview

The purpose of this investigation is to document the release(s) or potential release(s) of hazardous substances to groundwater from unknown source(s). This Work Plan was developed using available information obtained primarily through a review of files and previous site investigations. The information collected from the review of records was evaluated for data gaps, and additional information needs were incorporated into the Work Plan. This plan will be modified as necessary based on actual site conditions encountered.

The Health and Safety Plan, Quality Assurance Project Plan (Document Number 201002.0, Effective 2/1/10 – 1/31/11) (QAPP), Site Reconnaissance Checklist, Preliminary Assessment Report and TCEQ's Remediation Division Standard Operating Procedures are presented as Appendices A through E, respectively.

Site Objectives with Respect to the Pre-Remedial Process

The pre-remedial stage of the Superfund process involves a preliminary assessment (PA) and a site inspection (SI) stage consisting of an SI and, if necessary, a listing site inspection (LSI). This SI is being conducted to determine if the Circle Court Groundwater Site (TXN000606965) is eligible for proposal to the National Priorities List (NPL) under the Federal Superfund Program. This SI will concentrate on assessing potential sources and evaluate threats along the groundwater and soil migration pathways.

This SI will build upon existing data by obtaining additional background information relevant to the Site through a file review and collecting environmental samples to further characterize conditions at or near the Site. Sampling conducted during the field work will attempt to document hazardous substance migration to and from the Site from potential sources and look for evidence of actual human and environmental exposure to hazardous substances.

Project Contacts

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SECTION 2: SITE BACKGROUND AND DESCRIPTION

The following site information is taken from the Preliminary Assessment (PA) Report which was prepared for the Site in March 2009 and is included as Appendix D. Further details regarding the Site background and description can be found in the PA Report.

Site Information

The Site is designated as contaminated groundwater in the Paluxy Aquifer originating from an unknown source. A volatile organic compound (VOC), trichloroethene (TCE), was first detected in concentrations above the EPA maximum contaminant limit (MCL) for drinking water of 5 micrograms per liter (μg/L) on March 23, 2006. The TCE detection of 6.03 μg/L was the outcome of routine VOC monitoring conducted at the distribution system point of entry (POE) for Willow Park Municipal System Well 20 (Source Code G1840027U). The well was taken out of service on April 1, 2006. Follow-up sampling conducted on May 4, 2006 directly from the well revealed a TCE level of 33.9 μg/L. Granular activated carbon (GAC) filters were installed on the impacted well on June 19, 2006, and the well was subsequently put back into service. The well (State Well No. 32-19-201) is screened in the Paluxy Aquifer.

The surface location of the Site is 117 Circle Court, 100 yards north-northwest of the intersection of Circle Drive and Circle Court in Willow Park, Parker County, Texas. It lies 0.3 miles south of Interstate 20 and 0.3 mile west of FM 5 (Annetta Road) and is 6 miles east of the City of Weatherford. A 15-acre vacant wooded lot borders the Site on the north. Lake Weatherford is approximately 1.75 miles north of the Site. The main building of the Parker County Airport is 0.3 miles northwest of the Site at 3816 E. Interstate 20 in the City of Hudson Oaks, and the nearest point of the north/south-oriented airport runway is 0.2 miles west of the Site. A lawnmower repair shop is located 0.28 miles northwest of the Site, and a strip shopping center, which includes a dry cleaner facility and a gas station, is located 0.2 miles east-northeast of the Site. Single-family residences immediately surround the Site on the south, west and east sides (Figure 1). The primary drinking water aquifer in the area is the Paluxy Aquifer. Some residences in the community depend on private water wells screened in the Paluxy Aquifer as their primary drinking water source.

As a result of the detection of TCE in March and May 2006, Eagle Construction and Environmental Services, L.P. (Eagle) mobilized to the City of Willow Park on June 1, 2006 to initiate sampling of select private water wells in the vicinity of Willow Park Municipal System Well 20. Because of the potential emergency situation of multiple private well owners drinking contaminated groundwater, the TCEQ Field Operations Division authorized Eagle to collect and have analyzed water samples from nine (9) private water wells in the vicinity (Figure 2). The samples were analyzed for concentrations of VOCs by a drinking water certified laboratory utilizing drinking water methods. A review of the laboratory analytical results in indicated that concentrations of TCE (above laboratory detection limits) were detected in samples collected from five (5) of the private water wells (Appendix D).

Because the constituent of concern, TCE, originated from an unknown source, the SI will include an assessment of groundwater and soil within one (1) mile of the Site.

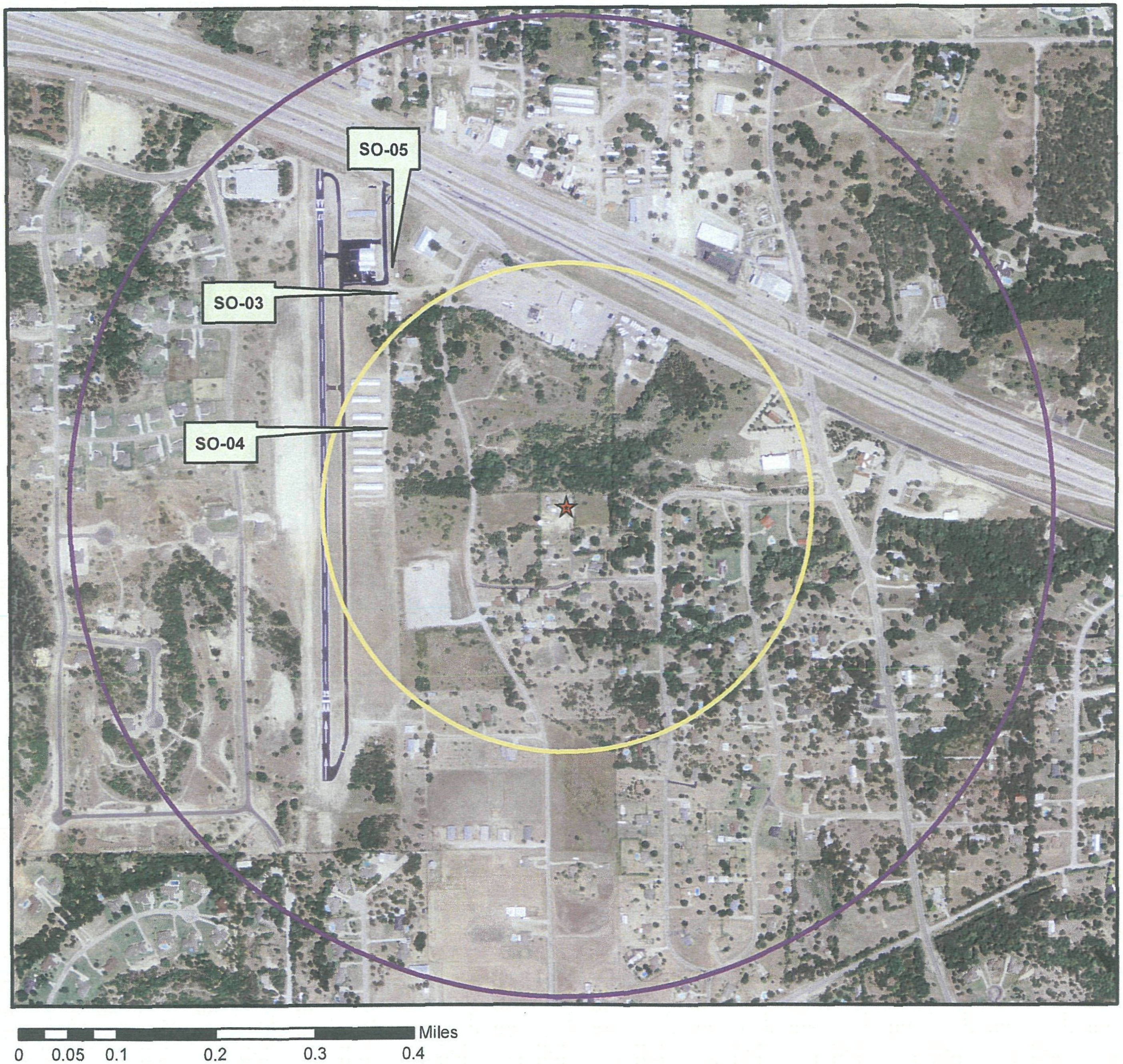
As a result of the detection of TCE in March and May 2006, Eagle Construction and Environmental Services, L.P. (Eagle) mobilized to the City of Willow Park on June 1, 2006 to initiate sampling of select private water wells in the vicinity of Willow Park Municipal System Well 20. Because of the potential emergency situation of multiple private well owners drinking contaminated groundwater, the TCEQ Field Operations Division authorized Eagle to collect and have analyzed water samples from nine (9) private water wells in the vicinity (Figure 2). The samples were analyzed for concentrations of VOCs by a drinking water certified laboratory utilizing drinking water methods. A review of the laboratory analytical results in indicated that concentrations of TCE (above laboratory detection limits) were detected in samples collected from five (5) of the private water wells (Appendix D).

Because the constituent of concern, TCE, originated from an unknown source, the SI will include an assessment of groundwater and soil within one (1) mile of the Site.

Figure 2. Excerpt from Eagle Report. Locations of Private Water Wells Sampled June 1-2, 2006

Eagle Construction and Environmental Services, L.P. 9204 NW Hwy 287 Fort Worth, TX 76131	**Date: 6/6/06** **Project No. 02-64-0019**	**Figure 1** **Location of Private Water Wells** **TCEQ-Willow Park** **Willow Park, Texas**	N

Figure 3 - Proposed Soil Sample Locations



TCEQ

This map was generated by the Remediation Division of the Texas Commission on Environmental Quality. It is intended for illustrative or informational purposes only and is not suitable for legal, engineering, or survey purposes. This map does not represent an on-the-ground survey conducted by or under the supervision of a registered professional land surveyor. In cases where property boundaries are shown, only approximate relative locations are represented. No claims are made as to the accuracy or completeness of the data or its suitability for a particular use. For more information concerning this map, contact the Remediation Division at 800-633-9363.

Circle Court Groundwater
Parker County, Texas
TXN000606965

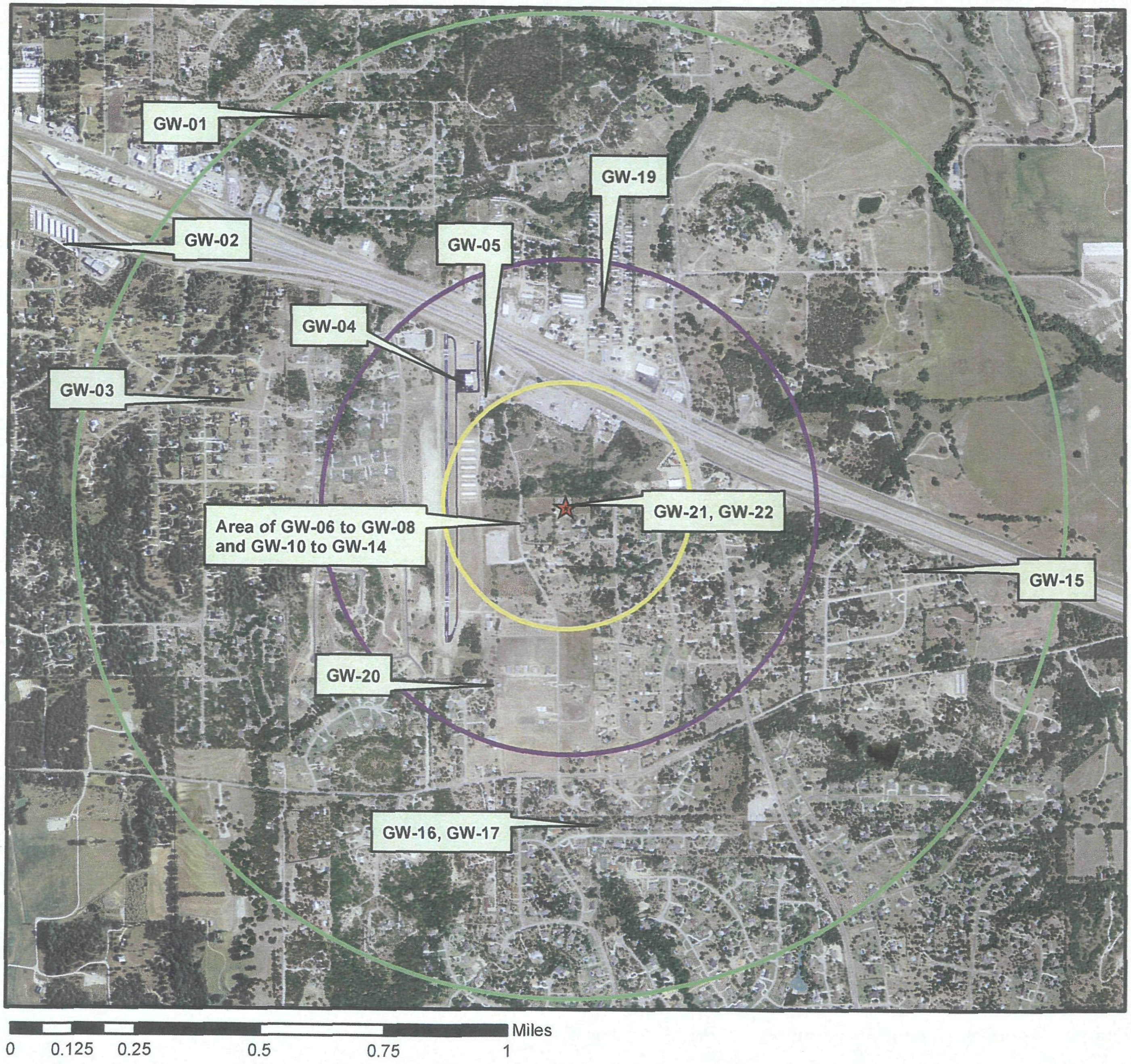
Site

1/4-Mile Radius

1/2-Mile Radius

N

Figure 4 - Proposed Groundwater Sample Locations



TCEQ

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Circle Court Groundwater
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Site

1/4-Mile Radius

1/2-Mile Radius

1-Mile Radius

N

SECTION 3: SITE NON-SAMPLING AND SAMPLING DATA COLLECTION AND FIELD WORK

TCEQ will perform the activities described in this section to provide analytical data that can be used by the EPA to facilitate EPA's assignment of site priorities. This information will be presented in an SI report that includes groundwater and soil sampling as discussed below.

All field work will be conducted in accordance with the Site Health and Safety Plan (HASP) (Appendix A) and the EPA-approved QAPP (Appendix B). These plans will be reviewed by all personnel upon arrival at the Site.

Personnel Requirements and Responsibilities

The TCEQ PA/SI Program Manager, Melissa Cordell, and Work Leader, Robert Musick, are responsible for identifying, assigning, and organizing the staff to execute the activities required to complete the SI. The Project Manager, Nancy Johnson, is responsible for completing the activities described in this plan and adhering to the sampling activities and report schedule. The planned field schedule for activities to be conducted for Site assessment is listed in Table 1.

The TCEQ Program Manager, Melissa Cordell, and Work Leader, Robert Musick, will review all major reports and provide technical and administrative support to the Project Manager. The TCEQ Program Manager and Work Leader will review the work plan and final report and will approve the final versions. The EPA Region VI Site Assessment Manager (SAM) is responsible for approving the work plan and the final report.

The TCEQ Program Manager will provide each member of the TCEQ inspection team and the Project Manager with letters of introduction stating the purpose of the investigation and authorization to conduct appropriate field activities. The TCEQ will send notification letters to the appropriate well owners informing them of the impending sampling activities and requesting access authorization for TCEQ personnel. The TCEQ will make arrangements for the property visit only after receiving written or verbal access authorization from the property owner or their representatives.

Table 1. Tentative Field Schedule

Time	Site Activity/Event
	Day 1 (March 8, 2010) –Travel; Soil Sampling
0700	Load truck with field equipment. Review equipment checklist. Travel to City of Willow Park.
1300	Meet with other TCEQ personnel at Willow Park Municipal System's Willow Springs Oaks pump station, the staging area. Discuss planned sampling event and answer questions. Review Health and Safety Plan. Modify sampling plan/schedule (if required). Prepare sampling equipment and calibrate field equipment as required.
1430	Collect soil samples. Document sample locations w/photos, log book entries and GPS data.
1600	Prepare samples for shipment and complete log book/CLP lab documentation.
1800	Deliver samples for overnight shipment and document day's activities in log book. Notify EPA of shipment via telephone and e-mail necessary Forms II Lite files to EPA. Make necessary preparations for next day's sampling.
1830	End of day.
	Day 2 (March 9, 2010) - Groundwater Sampling
0730	Arrive at the staging area. Conduct daily safety briefing, prepare sampling equipment and calibrate field equipment as required.
0900	Begin collecting groundwater samples from private and public wells. Document sample locations w/photos, log book entries and GPS data.
1200	Break for lunch
1300	Continue collecting groundwater samples from private and public wells. Document sample locations w/photos, log book entries and GPS data.
1500	Prepare samples for shipment and complete log book/CLP lab documentation.
1800	Deliver samples for overnight shipment and document day's activities in log book. Notify EPA of shipment via telephone and e-mail necessary Forms II Lite files to EPA. Make necessary preparations for next day's sampling.
1830	End of day.

Table 1. Tentative Field Schedule *(Continued)*

Time	Site Activity/Event
	Day 3 (March 10, 2010) - Groundwater Sampling *Continued*
0730	Arrive at the staging area. Conduct daily safety briefing, prepare sampling equipment and calibrate field equipment as required.
0900	Continue collecting groundwater samples from private and public wells. Document sample locations w/photos, log book entries and GPS data.
1200	Break for lunch
1300	Continue collecting groundwater samples from private and public wells. Document sample locations w/photos, log book entries and GPS data.
1500	Prepare samples for shipment and complete log book/CLP lab documentation.
1800	Deliver samples for overnight shipment and document day's activities in log book. Notify EPA of shipment via telephone and e-mail necessary Forms II Lite files to EPA. Make necessary preparations for next day's sampling.
1830	End of day.
	Day 4 (March 11, 2010) - Groundwater Sampling *Continued*
0730	Arrive at the staging area, review health and safety plan, conduct daily safety briefing, review sampling plan, prepare sampling equipment, and calibrate field equipment as required.
0900	Continue collecting groundwater samples. Document sample locations w/photos, log book entries and GPS data.
1200	Lunch.
1300	Continue collecting groundwater samples. Document sample location w/photos, log book entries and GPS data.
1500	Prepare samples for shipment and complete log book/CLP lab documentation.
1800	Deliver samples for overnight shipment and document day's activities in log book. Notify EPA of shipment via telephone and e-mail necessary Forms II Lite files to EPA.
1830	End of sampling event.
	Day 5 (March 12, 2010) – Travel
0800	Return travel from City of Willow Park. Unload field equipment from truck.

Community Relations

Prior to the start of any work to evaluate the Site, the TCEQ will inform appropriate authorities of the intended sampling event. Property owners where samples will be collected will be contacted by letter or by telephone prior to the Site reconnaissance visit in order to coordinate schedules and minimize conflict to obtain access. Requests for site-specific information will be made during the interview process or identified in the letter from the TCEQ. The TCEQ will make no other formal notifications of the SI sampling event. Sample results will be sent to each property owner, for their property sample only, upon completion of the data quality assurance process. Before or after the planned site inspection, any requests for information the TCEQ receives from the above parties will be referred through the PA/SI Program Manager, Melissa Cordell, or her designee, for an appropriate response. Any requests for information by the news media or parties will be directed through the TCEQ PA/SI Program Manager, or her designee, and to the TCEQ Central Office Media Relations Office, P.O. Box 13087, Austin, Texas, 78711, telephone number (512)-239-5000.

Work Plan Activities

Task 1: Non-sampling Activities and Rationale

The field team will meet (every morning while sampling for the SI) at a suitable location for or at the Site staging area. The purpose of the meeting will be to conduct an initial safety briefing and review the intended sampling work schedule. Information concerning past and current site conditions outlined in the SI work plan will be discussed and verified. The Project Manager will record significant comments in the field logbook pertaining to site and property history and current/past operations.

After the initial meeting, a site reconnaissance inspection will be completed by designated team members. Information will be logged in the field log book to include names of individuals interviewed, physical/mailing addresses, date and time of interviews and observations noted. Information outlined in the Site Reconnaissance Checklist (Appendix C) applicable to the Site and off-site areas will be obtained during the inspection. The Site reconnaissance will be conducted at level D (modified) protection, if appropriate.

During the initial reconnaissance inspection to evaluate the Site, the sampling team may be accompanied by the property owner or their designated representative to assist in identifying potential hazards. Appropriate safety equipment will be required by each team member, which will include steel-toed boots. Personal protective equipment will be modified level D.

Each sample location will initially be approached to detect and identify any physical hazards that may be present and to identify evidence of contaminant migration. Any visual evidence of a release of hazardous substances will be noted to ascertain whether additional protective equipment will be required for the sampling events. In general, personal safety requirements will be identified and assessed during the initial site reconnaissance inspection. In addition, safe entry and exit points will be identified for each proposed sample location.

Upon completion of the Site reconnaissance activities, the field team will again review the sampling plan. Sample locations will be adjusted as necessary to ensure that the samples provide sufficient data to properly evaluate the Site. Photographs will be taken as required to document site and property conditions and support observations recorded in the field log book. At each sample location, the following information will be collected:

- Location
- Name of photographer
- Date, time, and direction of photograph
- Description of situation/scene photographed
- Type of camera
- GPS coordinates
- Type of GPS unit
- GPS data collector
- Weather conditions
- Contacts with well owners or City officials.

In addition, the following non-sampling data will be collected:

- Location of potential source areas attributable to the Site through direct field observation and/or interviews with current property owners.

- Verification by inspection, photographs and personal interviews whether the wells are in use, for what purpose and the number of people served. Obtaining addresses, water level measurements, well construction/plumbing details, well development procedures, water quality test results, and aquifer pumping data from the well owners, if available.

Task 2: Sampling Activities and Rationale

The following section describes the proposed sampling plan for the Site. This plan may be modified as a result of the on-site reconnaissance and/or noted property access constraints. The soil and groundwater samples to be collected and sample rationale are listed in Table 2. Proposed soil sample locations identified are indicated in Figure 3. Proposed groundwater sample locations identified are indicated in Figure 4. Sample locations will be confirmed during the Site reconnaissance inspection and noted in the field log book. A field copy of this Work Plan will be annotated by the Project Manager to reflect actual sample locations.

Table 2. Proposed Soil Samples to be Collected

Sample Matrix	Sample ID	Sample Location *	Rationale
	Sampling Day 1		
Soil	SO-01	To be determined (depth 0"- 6")	**Background** soil sample to establish background concentrations.
	SO-02	To be determined (depth 0"- 6")	**Background** soil sample to establish background concentrations.
	SO-03	Collected at a depth 0"- 6" in the vicinity of the lawnmower repair shop southeast of the Parker County Airport office.	Determine release of contaminants.
	SO-04	Collected at a depth 0"- 6" in the vicinity of the airplane hangars at the Parker County Airport.	Determine release of contaminants.
	SO-05	Collected at a depth 0"- 6" at residence located on Russell Road, 200 feet east of the Parker County Airport office.	Determine release of contaminants.
	SO-06	Field Duplicate sample collected at the same location as SO-05 MS/MSD Sample collected at same location as SO-05	**Quality Assurance/Quality Control (QA/QC)**
Aqueous	GW-31	Field Blank	QA/QC. One per day for each matrix collected. Location will be determined in the field.

***Please note that some residents have not provided access agreements. A written or verbal access agreement must be obtained prior to sampling activities. Sample locations may change due to access issues. Access agreements are being pursued for each groundwater sample ID identified above.**

Table 3. Proposed Groundwater Samples to be Collected

Sample Matrix	Sample ID	Sample Location *	Rationale
		Sampling Day 2	
Groundwater	GW-01	**Background Well. PWS well - Highland WSC Well 4. Depth 250 ft.	Background sample collected upgradient from Site.
	GW-02	**Background Well. PWS well - City of Hudson Oaks Well 6P. Depth 215 ft.	Background sample collected upgradient from Site.
	GW-03	**Background Well. PWS well - City of Hudson Oaks Well 1P. Depth 231 ft.	Background sample collected upgradient from Site.
	GW-04	Private commercial non-drinking water well at Parker County Airport. Unknown depth.	Determine release of contaminants.
	GW-05	**Commercial/Domestic well at Ron's Mower Shop, 0.28 mi. northwest of Willow Park Municipal System's PWS Well No. 20. Unknown depth.	Determine release of contaminants.
	GW-06	**Domestic Well – Sherman residence, 300 Russell Road. Within 1/4 mile of Willow Park Municipal System's PWS Well No. 20. Unknown depth	Determine release of contaminants.
	GW-07	**Domestic Well – Hall residence, 503 Russell Road. Within 1/4 mile of Willow Park Municipal System's PWS Well No. 20. Depth 261 ft.	Determine release of contaminants.
	GW-08	Field Duplicate sample collected at the same location as GW-07. MS/MSD Sample collected at same location as GW-07	Quality Assurance/Quality Control (QA/QC)
	GW-09	Field Blank. Location will be determined in the field	QA/QC. One per day for each matrix collected.

Table 3. Proposed Groundwater Samples to be Collected *(Continued)*

Sample Matrix	Sample ID	Sample Location*	Rationale
		Sampling Day 3	
Groundwater	**GW-10**	**Domestic Well – Lasater residence, 546 Russell Road. Within 1/4 mile of Willow Park Municipal System's impacted PWS well. Unknown depth.	Determine release of contaminants.
	GW-11	**Domestic Well – Davis residence, 550 Russell Road. Within 1/2 mile of Willow Park Municipal System's impacted PWS well. Depth 240 ft.	Determine release of contaminants.
	GW-12	**Domestic Well – Murphy residence, 108 E. Circle Drive. Within 1/4 mile of Willow Park Municipal System's impacted PWS well. Unknown depth.	Determine release of contaminants.
	GW-13	**Domestic Well – Keller residence, 110 Circle Drive. Within 1/4 mile of Willow Park Municipal System's System's impacted PWS well. Unknown depth.	Determine release of contaminants.
	GW-14	**Domestic Well – Liepert residence, 408 Deer Pond Drive. Within 1/4 mile of impacted Willow Park Municipal System's impacted PWS well. Depth 240 ft.	Determine release of contaminants.
	GW-15	**PWS – Willow Park Municipal System's PWS Well No. 17. Within 1 mile of Willow Park Municipal System's impacted PWS well. Depth 260 ft.	Determine release of contaminants.
	GW-16	**PWS – Willow Park Dyegard System's PWS Well No. 1. Within 1 mile of Willow Park Municipal System's impacted PWS well. Depth 253 ft.	Determine release of contaminants.
	GW-17	Field Duplicate collected at the same location as GW-16	Quality Assurance/Quality Control (QA/QC)
	GW-18	Field blank. Location will be determined in the field	QA/QC. One per day for each matrix collected. Location will be determined in the field.

Table 3. Proposed Groundwater Samples to be Collected ***(Continued)***

Sample Matrix	Sample ID	Sample Location *	Rationale
		Sampling Day 4	
Groundwater	**GW-19**	**PWS – Oak Hill Mobile Home Park's Well No. 1. Within 1/2 mile of Willow Park Municipal System's impacted PWS well. Depth 230 ft.	Determine release of contaminants.
	GW-20	**PWS – Willow Park Dyegard System's PWS Well No. 2. Within 1/2 mile of Willow Park Municipal System's impacted PWS well. Depth 260 ft.	Determine release of contaminants.
	GW-21	**PWS – Willow Park Municipal System Well No. 20. Impacted PWS well. Depth 240 ft.	Determine release of contaminants.
	GW-22	**Domestic Well – Callaway residence, 121 Addison Ct. Within 1/2 mile of Willow Park Municipal System's impacted PWS well. Depth unknown.	Determine release of contaminants.
	GW-23	**Domestic Well – Kersh residence, 212 Megan Ct. Within 1 mile of center Willow Park Municipal System's impacted PWS well. Depth unknown.	Determine release of contaminants.
	GW-24	**Domestic Well – Murphy residence, 6141 E. Bankhead Hwy. Within 1 mile of center Willow Park Municipal System's impacted PWS well. Depth unknown.	Determine release of contaminants.
	GW-25	Field Duplicate collected at the same location as GW-24. MS/MSD Sample collected at same location as GW-21	Quality Assurance/Quality Control (QA/QC)
	GW-26	Field blank. Location will be determined in the field	QA/QC. One per day for each matrix collected. Location will be determined in the field.

***Please note that some residents have not provided access agreements. A written or verbal access agreement must be obtained prior to sampling activities. Sample locations may change due to access issues. Access agreements are being pursued for each groundwater sample ID identified above.**

**** Drinking Water Well**

Waste Containment/Hazardous Substance Identification

Based on existing site characterization data collected during the Pre-CERCLIS site visit conducted on March 6, 2007, no source of the TCE detected in the Willow Park Municipal System public water supply well has been identified.

In order to obtain legally-defensible site characterization data, a laboratory will be designated to perform EPA-stipulated Contract Laboratory Program (CLP) analytical methods on all samples collected to evaluate the Site to adequately document current site conditions. The specific analytical methods for this sampling event are those listed under the CLP routine analytical services (RAS) contract.

Soil samples will be collected at locations upgradient (surface and groundwater flow) from the impacted well, and groundwater samples will be collected from the primary drinking water aquifer that is being used by the residences in the vicinity of the Site. Collected samples will be used to characterize potential sources and to assess the potential migration of hazardous substances to the groundwater migration and soil exposure pathways. In addition, background soil and groundwater samples will be collected to determine the naturally-occurring background levels of the contaminant of concern in unaffected off-site locations for attribution of detected contaminants.

Soil Sampling

Soil samples will be collected from potential source areas and near the Site where VOCs are suspected. Soil sample collection will be conducted according to procedure SW-846 Method 5035A as described in Appendix A of the QAPP (Appendix B). The purpose of the samples will be to investigate the potential for migration of contaminants from the soils to the Paluxy aquifer. Soil samples will be analyzed for volatile organics, semi-volatile organics, pesticides, aroclors, metals, mercury and cyanide.

For the purpose of this SI, a total of six (6) soil samples will be collected, including one (1) duplicate sample and two (2) background samples. Soil sample identification, location, and sample rationale are provided in Table 2. Background soil sample locations will be determined in the field by the Project Manager. Figure 2 shows several locations within a ½-mile radius of the Site that are planned to be sampled. Sample containers, preservatives, and holding times are provided in Table 4. Surface soil sampling procedures are described in detail in Section B2 of the QAPP (Appendix B).

Groundwater Sampling

Groundwater samples will be collected from eight (8) PWS wells, eleven (11) private domestic drinking water wells and one (1) private commercial non-drinking water well to determine the potential for release of contaminants to the Paluxy aquifer. The proposed sample locations include the impacted Willow Park Municipal System Well 20 and the nine private water wells in the vicinity of the impacted well which were sampled by Eagle in June 2006 (Figure 2). Further information regarding the nine private wells can be found in the Preliminary Assessment Report (Appendix D). Of these proposed sample locations, eight (8) are located within 1/4 mile of the center of the Site, five (5) are within 1/2 mile of the PWS well and four (4) are within 1 mile of the PWS well. All PWS and private water wells to be sampled are Paluxy Aquifer wells. Additionally, three (3) background groundwater samples will be collected from Paluxy Aquifer PWS wells upgradient from the site. Groundwater sample identification, location and sample rationale are provided in Table 3. Samples will be analyzed for volatile organics, semi-volatile organics, pesticides, aroclors, metals, mercury and cyanide. Contaminant pathways include seepage and infiltration from the unidentified source(s) into the underlying aquifer. Some groundwater well sample locations may be determined in the field by the Project Manager. Figure 3 shows several wells located within a 1-mile radius of the Site that are planned to be sampled. Based on data compiled by the Texas Water Development Board (TWDB), most wells within the 1-mile radius are typically drilled to depths between 180 and 270 ft. below ground surface (bgs).

For the purposes of this SI, a total of twenty-six (26) groundwater samples, including three (3) duplicate samples, will be collected. All samples will be grab samples. Sample identification, location, and sample rationale are provided in Table 3. Sample containers, preservatives, and holding times are provided in Table 4. Well purging and groundwater sampling procedures are described in detail in Section B2 of the QAPP (Appendix B) and in the SOPs 7.9 and 7.10 (Appendix E).

Table 4. Sample Containers, Preservatives and Holding Times for Aqueous and Soil Samples

Parameters	Sample Container	Preservative	Holding Time
Volatile Organics	Aqueous – Three 40 mL glass vials with polypropylene or phenolic caps and polytetrafluoroethylene (PTFE) lined septa. Leave no headspace.	Cool to 4^0C	7 Days
	Soil – Encore vials	Cool to 4^0C	48 hours
Semivolatile Organics/Pesticides/ Aroclors	Aqueous – Two 1 L amber round glass bottles with polypropylene or phenolic caps with PTFE liner.	Cool to 4^0C	7 Days
	Soil – One 8 oz wide mouth glass jar with polypropylene or phenolic cap with PTFE liner.	Cool to 4^0C	14 Days
Metals and Mercury	Aqueous – One 1 L polyethylene bottle with polyethylene cap and liner.	Cool to 4^0C Add HNO_3 pH < 2	6 months for all metals except mercury (28 days)
	Soil – One 8 oz wide mouth glass jar with polypropylene or phenolic cap with PTFE liner.	Cool to 4^0C	6 months for all metals except mercury (28 days)
Cyanide	Aqueous – One 1 L polyethylene bottle with polyethylene cap and liner.	Cool to 4^0C Add NaOH pH > 12	14 Days
	Soil – Same 8 oz wide mouth glass jar with polypropylene or phenolic cap with PTFE liner used for metals and mercury.	Cool to 4^0C	14 Days

The number of sample containers may change based on CLP laboratory requirements.

Quality Assurance/Quality Control Samples (QA/QC)

Four types of QA/QC samples will be collected during this site inspection. Table 5 summarizes the QA/QC samples and frequencies of collection. Field duplicate samples will be collected at the rate of one (1) field duplicate per ten (10) samples of each matrix, per day.

One (1) lab Q/C (matrix spike/matrix spike duplicate) will be collected at the rate of one (1) lab Q/C per twenty (20) samples. Typically, triple volume is required for organic samples and double volume is required for inorganic samples. The lab Q/C will be included in the first shipment of samples to the laboratory.

Field blanks will be collected at the rate of one (1) field blank per day per sample matrix. Field blanks will be collected at the same location as a groundwater and soil sample to ensure exposure to the same hazardous substances as the field sample (e.g., airborne contaminants that are not from the matrix being sampled). The field blanks will be prepared by pouring CLP-specified grade water into a clean volatile organic analysis (VOA) sample container and prepared in the same manner as the sample.

One temperature blank will be included in each cooler shipped to a laboratory to ensure that samples are properly cooled during shipment. The temperature blank is a VOA 40 mL vial filled with water and labeled "Temp Blank." Temperature blanks accompany the sample containers through collection and shipment to the laboratory, and are stored with the samples. Results of shipment temperatures will be maintained with the corresponding sample analytical data in the project file.

Table 5. Quality Control Samples

Quality Control Sample	Frequency of Collection
Laboratory QC (Matrix Spike/Matrix Spike Duplicate or MS/MSD)	1 for every 20 project samples of each matrix.
Field Blanks	1 per day per matrix collected for volatile analysis.
Field Duplicates	1 for every 10 samples of each matrix, per day.
Temperature Blanks	1 per shipping cooler.

Task 3: Decontamination Procedures

Equipment Decontamination

Proper decontamination procedures will aid in preserving the representativeness of the samples collected. The specific decontamination procedures for this sampling event are those outlined in Section B of the PA/SI QAPP (Appendix B). Dedicated sampling equipment will normally be used to collect the samples during the SI. To minimize cross contamination during processing and handling, the outside of each closed and custody sealed sample container will be wiped clean with clean paper towels prior to placing the container into a clean plastic bag and bubble-wrapping it for shipment. An effort will be made to keep the outside of sample containers free of cross-contamination.

Decontamination fluids used to clean equipment will be disposed of in the approximate area of the sampling location in accordance with investigation derived waste (IDW) guidelines.

Personal Equipment Decontamination

All disposable clothing (i.e., Tyvek, gloves, etc.) will be rendered unusable prior to disposal to prevent inadvertent reuse. Boots will be scrubbed with detergent and rinsed with distilled water that will be disposed of properly. Decontamination fluids from the non-dedicated equipment rinse (if used) will also be disposed of properly.

Task 4: Sample Shipping

During sampling activities, samples will be packed and preserved according to procedures described in Section B3 of the QAPP (Appendix B). The Project Manager will ensure that all appropriate paperwork necessary to ship samples to the laboratories for analysis is completed. Details of the sample handling and chain-of-custody (COC) requirements are discussed in greater detail in Section B3 and Appendix A of the QAPP (Appendix B).

Each chain-of-custody form will be checked, signed and placed in a sealable plastic bag and taped to the inside lid of the cooler. The outside of the cooler will be sealed with tamper-resistant tape which cannot be removed without tearing it. The sample custodian will sign across the seal prior to shipping the samples. In the event the shipper has to remove the cooler seal, the receiving laboratory will verify and record that the individual container, bottle, or vial sample seals are still intact.

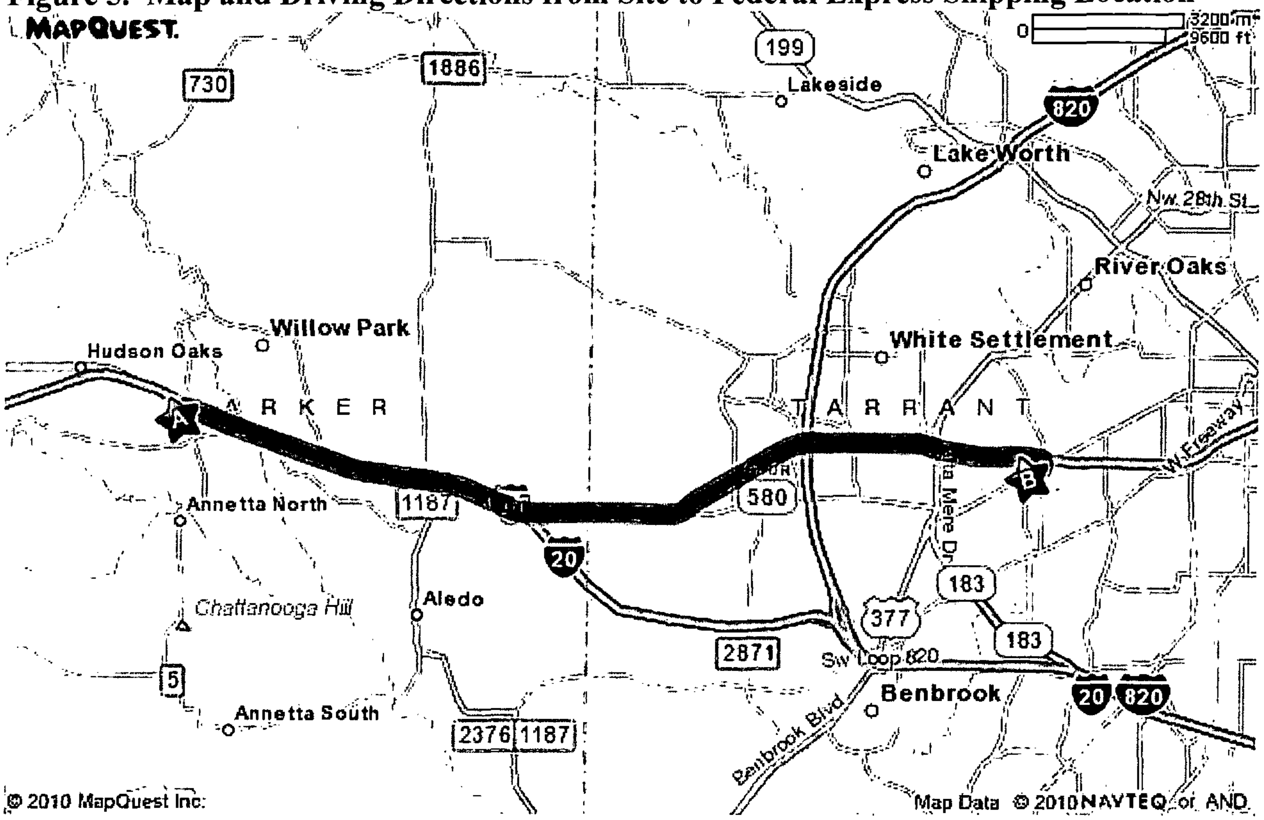
All samples will be sent to be analyzed at an EPA assigned Contract Laboratory Program (CLP) laboratory. The laboratory contacts are Myra Perez at 281-983-2130 or Christy Warren at 281-983-2137. Samples will be shipped the same day of collection.

EPA Region VI copies of the Traffic Reports will be faxed or e-mailed nightly to Myra Perez at 281-983-2124 or perez.myra@epa.gov. The extensible markup language (xml) file from FORMS II Lite will be e-mailed to warren.christy@epa.gov at the end of each work day.

The freight courier pickup point and office schedule in the vicinity of the study area is:

FedEx Office Print & Ship Center	Latest Express drop-off: 7:00 p.m. Monday - Friday
6020 Camp Bowie Blvd.	Store hours: 7:00 a.m. - 11:00 p.m. Monday - Friday
Fort Worth, TX 76116	(817) 737-8021

Figure 5. Map and Driving Directions from Site to Federal Express Shipping Location



Driving directions from Site to FedEx Office Print & Ship Center

A. 117 Circle Court	**B. 6020 Camp Bowie Blvd.**
Willow Park, TX 76087	**Fort Worth, TX 76116**

1. Start out going SOUTH on CIRCLE CT toward CIRCLE DR.	0.0 mi
2. Turn LEFT onto CIRCLE DR.	0.1 mi
3. Turn LEFT onto DEER POND DR.	0.3 mi
4. Turn LEFT onto ANNETTA RD/FM 5.	0.1 mi
5. Turn RIGHT onto I-20 SERVICE RD/FORT WORTH HWY.	0.2 mi
6. Turn SLIGHT LEFT to take the I-20 E ramp.	0.3 mi
7. Merge onto US-80 E.	8.7 mi
8. Merge onto I-30 E via the exit on the LEFT.	6.8 mi
9. Take EXIT 9B toward HORNE ST/CAMP BOWIE BLVD.	0.2 mi
10. Stay STRAIGHT to go onto CALMONT AVE.	0.1 mi
11. Turn RIGHT onto HORNE ST.	0.1 mi
12. Turn RIGHT onto CAMP BOWIE BLVD/US-377 S.	0.4 mi
13. End at 6020 CAMP BOWIE BLVD.	

REFERENCES

1. U.S. Environmental Protection Agency. Federal Register - 40 CFR Part 300; Hazard Ranking System; Final Rule, Volume 55, No. 241, December 14, 1990. 135 pages.

2. U.S. Environmental Protection Agency. Hazard Ranking System Guidance Manual, EPA 540-R-92-026, OSWER Directive 9345.1-07, November 1992. 431 pages plus Appendix.

3. U.S. Environmental Protection Agency. Guidance for Performing Site Inspections Under CERCLA, Office of Emergency and Remedial Response, Hazardous Site Evaluation Division, Publication 9345.1-05, September 1992. 125 pages.

REFERENCE 1

U.S. EPA. Federal Register - 40 CFR Part 300; Hazard Ranking System; Final Rule, Volume 55, No. 241, December 14, 1990.

12-14-90
Vol. 55 No. 241

federal register

Friday
December 14, 1990

Book 2

United States
Government
Printing Office
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Washington, DC 20402

OFFICIAL BUSINESS
Penalty for private use, $300

SECOND CLASS NEWSPAPER

Postage and Fees Paid
U.S. Government Printing Office
(ISSN 0097-6326)

REFERENCE 2

U.S. EPA. Hazard Ranking System Guidance Manual,
EPA 540-R-92-026, OSWER Directive 9345.1-07, November 1992.

United States
Environmental Protection
Agency

Office of Solid Waste
and Emergency
Response

Publication 9345.1-07
PB92-963377
EPA 540-R-92-026
November 1992

Superfund

EPA

Hazard Ranking System Guidance Manual

REFERENCE 3

U.S. EPA. Guidance for Performing Site Inspections Under CERCLA, Office of Emergency and Remedial Response, Hazardous Site Evaluation Division, Publication 9345.1-05, September 1992.

United States
Environmental Protection
Agency

Office of Emergency and
Remedial Response
Washington DC 20460

PB92963375

Superfund

9345.1-05

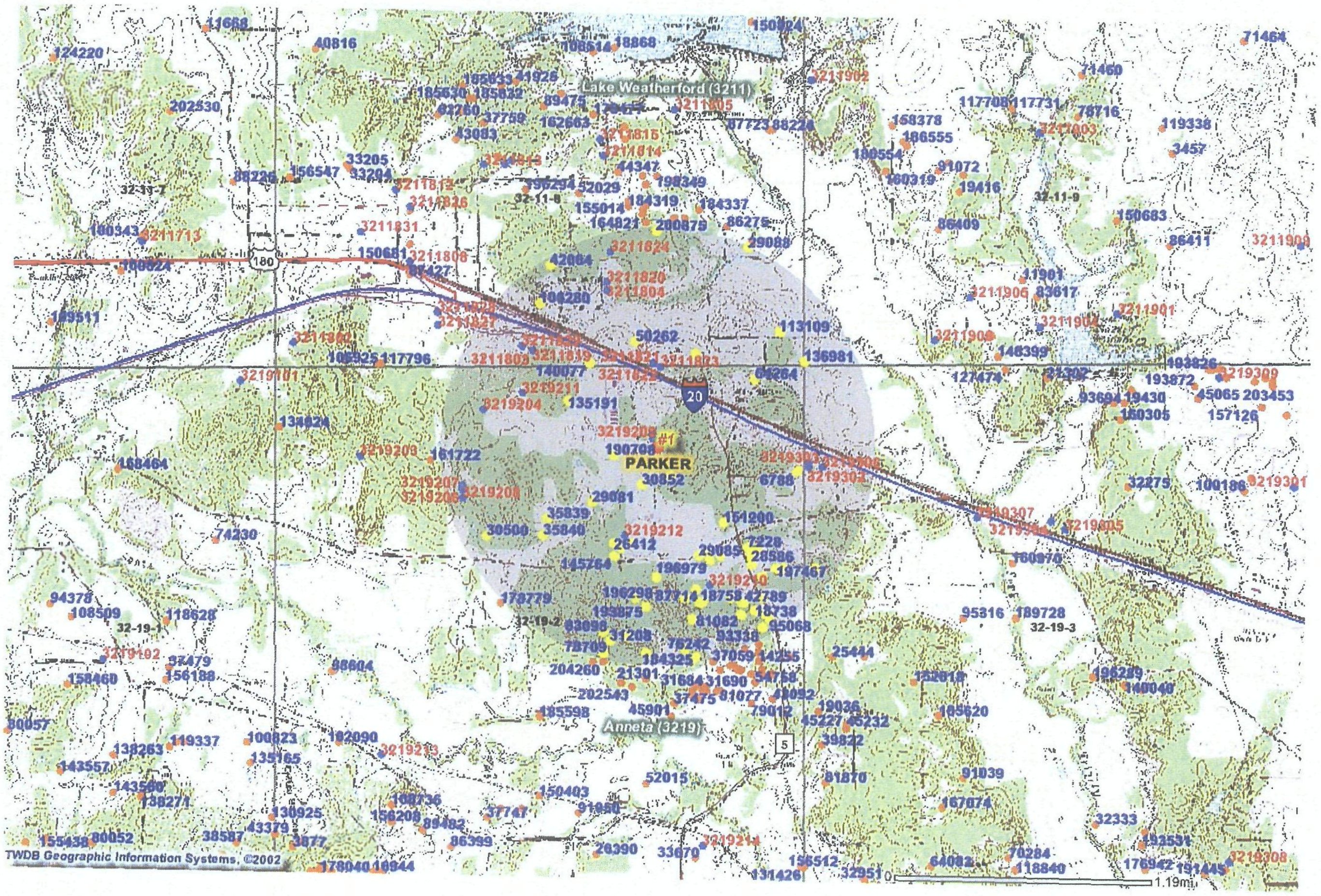
EPA

Guidance for Performing Site Inspections Under CERCLA

Interim Final

REFERENCE 4

Texas Water Development Board
Water Information Integration & Dissemination (WIID)
Groundwater Data
Submitted Drillers' Reports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PARKER
#1
Anneta (3219)
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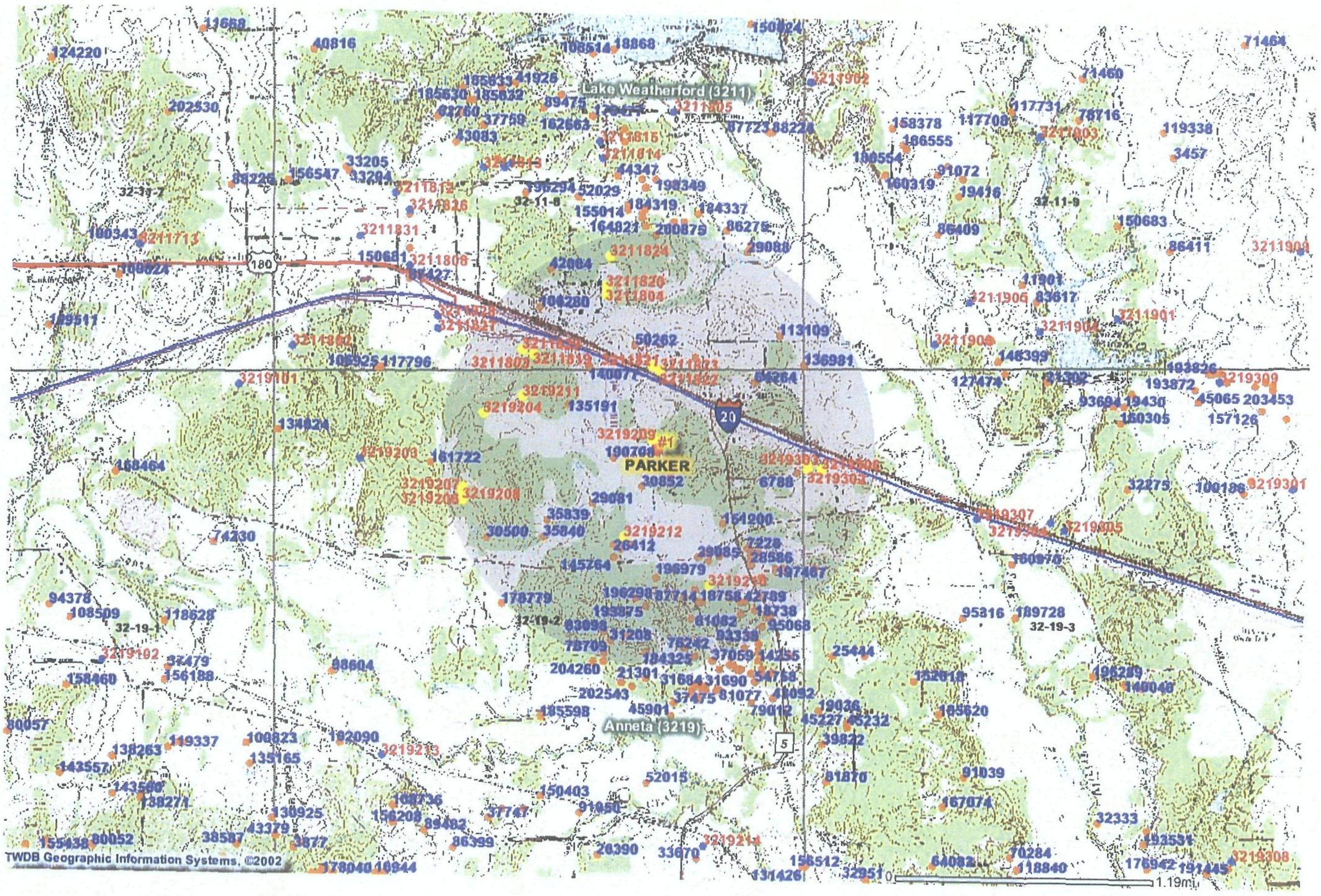

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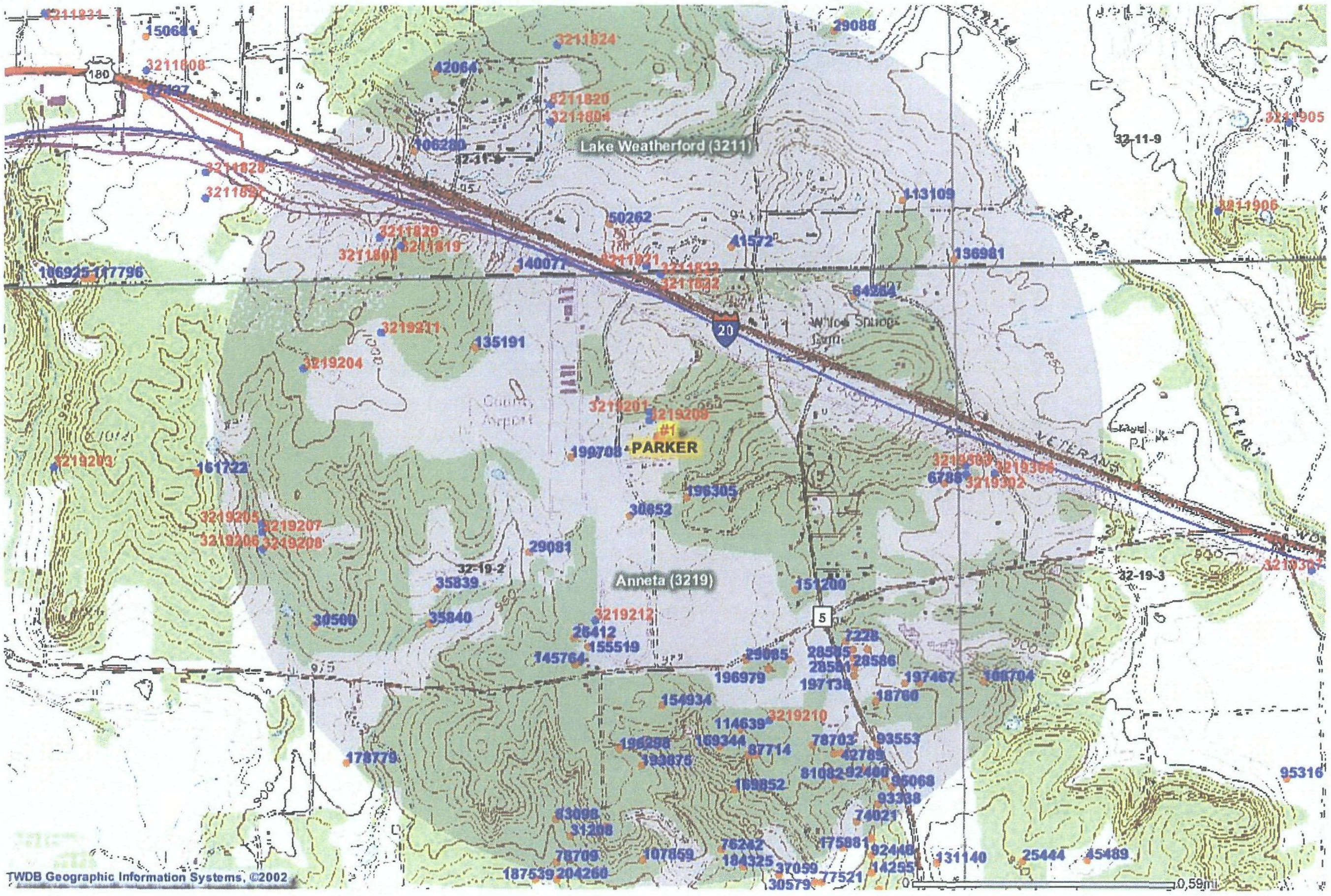
PARKER
Anneta (3219)
TWDB Geographic Information Systems, ©2002
1.19mi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Anneta (3219)
PARKER
#1
County Airport
TWDB Geographic Information Systems, ©2002
0.59mi
32-19-2
32-19-3
32-11-9

TWDB GROUNDWATER DATA *(Explanation)*

Rec	OBJECT	State Well Number	Owner	Water Use	Elevation	Well Depth	Water Level	Water Quality	Aquifer Code	Latitude	Longitude	COUNTY_CODE	WELL_TYPE	area	len
1	48448107	3211803	City of Hudson Oaks	P	990	240	M	Y	218PLXY	324504	974117	367	W	0	0
2	48448108	3211804	Highland Water Supply	P	940	180	M	Y	218PLXY	324518	974056	367	W	0	0
3	48448123	3211819	City of Hudson Oaks	P	990	200	M	Y	218PLXY	324504	974117	367	W	0	0
4	48448124	3211820	Highland Water Supply	P	942	180	N	N	218PLXY	324520	974056	367	W	0	0
5	48448125	3211821	Oak Hill Mobile Home	P	970	260	N	Y	218PLXY	324501	974043	367	W	0	0
6	48448126	3211822	Oak Hill MHP - East	P	975	230	N	N	218PLXY	324500	974041	367	W	0	0
7	48448127	3211823	Oak Hill MHP - East	P	975	250	N	N	218PLXY	324500	974041	367	W	0	0
8	48448128	3211824	Highland Park Addition	P	943	135	N	Y	218PLXY	324527	974055	367	W	0	0
9	48448133	3211829	Diamond Oaks	P	920	310	M	N	218PLXY	324505	974120	367	W	0	0
10	48448643	3219201	City of Willow Park	P	960	180	M	N	218PLXY	324444	974043	367	W	0	0
11	48448646	3219204	City of Hudson Oaks	P	1009	255	M	Y	218PLXY	324450	974131	367	W	0	0
12	48448647	3219205	City of Hudson Oaks	P	960	196	M	N	218PLXY	324432	974137	367	W	0	0
13	48448648	3219206	City of Hudson Oaks	P	950	225	M	N	218PLXY	324431	974137	367	W	0	0
14	48448649	3219207	City of Hudson Oaks	P	950	220	M	N	218PLXY	324431	974137	367	W	0	0
15	48448650	3219208	City of Hudson Oaks	P	948	220	M	N	218PLXY	324429	974137	367	W	0	0
16	48448651	3219209	City of Willow Park	P	960	244	M	N	218PLXY	324443	974043	367	W	0	0
17	48448652	3219210	Dyegard Water Co.	P	971	253	M	Y	218PLXY	324408	974027	367	W	0	0
18	48448653	3219211	Diamond Oaks	P	1000	275	M	N	218PLXY	324454	974120	367	W	0	0
19	48448654	3219212	Dyegard Water Co.	P	984	260	M	N	218PLXY	324420	974051	367	W	0	0
20	48448659	3219302	City of Willow Park	P	952	257	P	Y	218PLXY	324436	973959	367	W	0	0
21	48448660	3219303	City of Willow Park	P	952	250	P	Y	218PLXY	324437	973959	367	W	0	0
22	48448663	3219306	E. Neil	S	910	378	M	N	218PLXY	324436	973955	367	W	0	0

Zoom to these records

SUBMITTED DRILLER'S REPORTS

Rec	OBJECT	Tracking Number	Well Owner	County	Well Address	Well City	Zip Code	Date of Well Completion	Undesirable Water Quality	Well Type	Latitude	Longitude	area	len
1	44916420	6788	W. H. HANSEN	Parker	4823 Quail Crest	Willow Park	76087	Wed, 6 Mar 2002 00:00:00	no	Domestic	324435	974002	0	0
2	44916855	7228	DORAN CONSTRUCTION	Parker	402 Woodridge	Hudson Oaks	76086	Thu, 2 May 2002 00:00:00	no	Domestic	324417	974016	0	0
3	45091760	184325	Mike Gentry	Parker	1420 Oaklawn Ln	Aledo	76008	Thu, 27 Apr 2006 00:00:00	no	Irrigation	324351	974031	0	0
4	45092782	185379	Dale Walton	Parker	100 Dustin Circle	Weatherford	76086	Tue, 10 Oct 2006 00:00:00	no	Domestic	324356	974050	0	0
5	45092984	185586	Bill Getterick	Parker	100 Dustin Circle	Weatherford	76086	Wed, 11 Oct 2006 00:00:00	no	Domestic	324356	974050	0	0
6	45098054	190708	Perry J. Davis	Parker	555 Russell Rd	Hudson Oaks	76087	Fri, 14 Sep 2007 00:00:00	no	Domestic	324439	974054	0	0
7	45101187	193875	Jason & Christy Beaty	Parker	117 Danielle Dr	Aledo	76008	Thu, 12 Apr 2007 00:00:00	no	Irrigation	324403	974045	0	0
8	45103587	196298	Robert Stinnett	Parker	111 Oakview	Weatherford		Mon, 10 Jul 2006 00:00:00	no	Domestic	324405	974048	0	0
9	45103594	196305	Bill Galloway	Parker	512 Big Circle	Weatherford		Thu, 13 Jul 2006 00:00:00	no	Domestic	324434	974038	0	0
10	45104262	196978	Glenn Tilghman	Parker	100 Fredricksburg Ct.	Weatherford	76087	Thu, 27 Apr 2006 00:00:00	no	Irrigation	324416	974027	0	0
11	45104263	196979	Dean Wade	Parker	110 Fredricksburg Ct.	Weatherford	76087	Mon, 1 May 2006 00:00:00	no	Irrigation	324414	974027	0	0
12	45104419	197138	Mike & June Packer	Parker	1450 Claiborne Lane	Willow Park		Fri, 24 Sep 2004 00:00:00	no	Irrigation	324413	974015	0	0
13	45104420	197139	Kevin Rousseau	Parker	1447 Claiborne Lane	Willow Park		Fri, 24 Sep 2004 00:00:00	no	Irrigation	324416	974015	0	0
14	45104744	197467	JB Homes	Parker	1725 Woodridge Court	Willow Park	76008	Wed, 17 Nov 2004 00:00:00	no	Domestic	324412	974008	0	0
15	45108123	200875	Gene Pappas	Parker	1004 Forest Park Dr.	Weatherford	76087	Wed, 28 Jun 2006 00:00:00	no	Irrigation	324532	974042	0	0
16	44928198	18738	MR. TATE	Parker	1405 CLAIBORNE	ALEOD	76008	Mon, 10 Mar 2003 00:00:00	no	Domestic	324402	974014	0	0
17	44928218	18758	JEFF BYRN	Parker	1208 STEEPLECHASE	ALEDO	76008	Tue, 11 Mar 2003 00:00:00	no	Domestic	324404	974018	0	0
18	44928220	18760	HYNES CUSTOM HOMES	Parker	1441 WOODRIDGE DR	ALEDO	76008	Wed, 12 Mar 2003 00:00:00	no	Domestic	324410	974012	0	0
19	44935776	26412	KERSH, MIKE AND MARISSA	Parker	212 MEGEN CT	ALEDO	76008	Fri, 29 Aug 2003 00:00:00	no	Domestic	324418	974054	0	0
20	44937871	28581	DORAN CONSTRUCTION	Parker	1449 Woodridge Road	Aledo	76008	Wed, 17 Sep 2003 00:00:00	no	Domestic	324415	974015	0	0
21	44937875	28585	DORAN CONSTRUCTION	Parker	1452 Woodridge Road	Aledo	76008	Fri, 24 Oct 2003 00:00:00	no	Domestic	324415	974015	0	0
22	44937876	28586	DORAN CONSTRUCTION	Parker	1448 Woodridge Road	Aleco	76008	Thu, 11 Sep 2003 00:00:00	no	Domestic	324414	974015	0	0
23	44938361	29081	Timothy Hampton Kelley	Parker	512 Muir Hill Court	Annetta	76008	Wed, 7 May 2003	no	Domestic	324428	974100	0	0

APPENDIX A

Health and Safety Plan

TCEQ

Health and Safety Plan

Circle Court Ground Water
117 Circle Court
Willow Park, Parker County, TX

TXN000606965

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VI

Prepared in cooperation with the
U.S. Environmental Protection Agency

February 2010

HEALTH AND SAFETY PLAN
FOR
SITE INSPECTION FIELD WORK
CIRCLE COURT GROUND WATER

Prepared by

Texas Commission on Environmental Quality
Superfund Section
Austin, Texas

Reviewed and approved by

Site Safety Officer	Sugam Shrestha	03/04/10 Date
Site Project Manager	Nancy Johnson	3/2/10 Date
PA/SI Program Manager	Melissa Cordell Melissa Cordell	3/5/10 Date
TCEQ Central Office Health & Safety Officer	Omar Valdez	3/2/10 Date
Team Leader	Robert Musick	3/3/10 Date

February 22, 2010

Contents

APPENDICES

FIGURES

TABLES

EMERGENCY CONTACTS

In the event of any situation or unplanned occurrence requiring assistance, the appropriate contact(s) should be made from the list below. For emergency situations contact the appropriate response teams:

Site Location: Latitude: 32.745 N Longitude: -97.678333W

Contingency Contacts	Phone Number
Fire Department	911
Police	911
Sheriff's Department	911
Ambulance	911

Medical Emergency

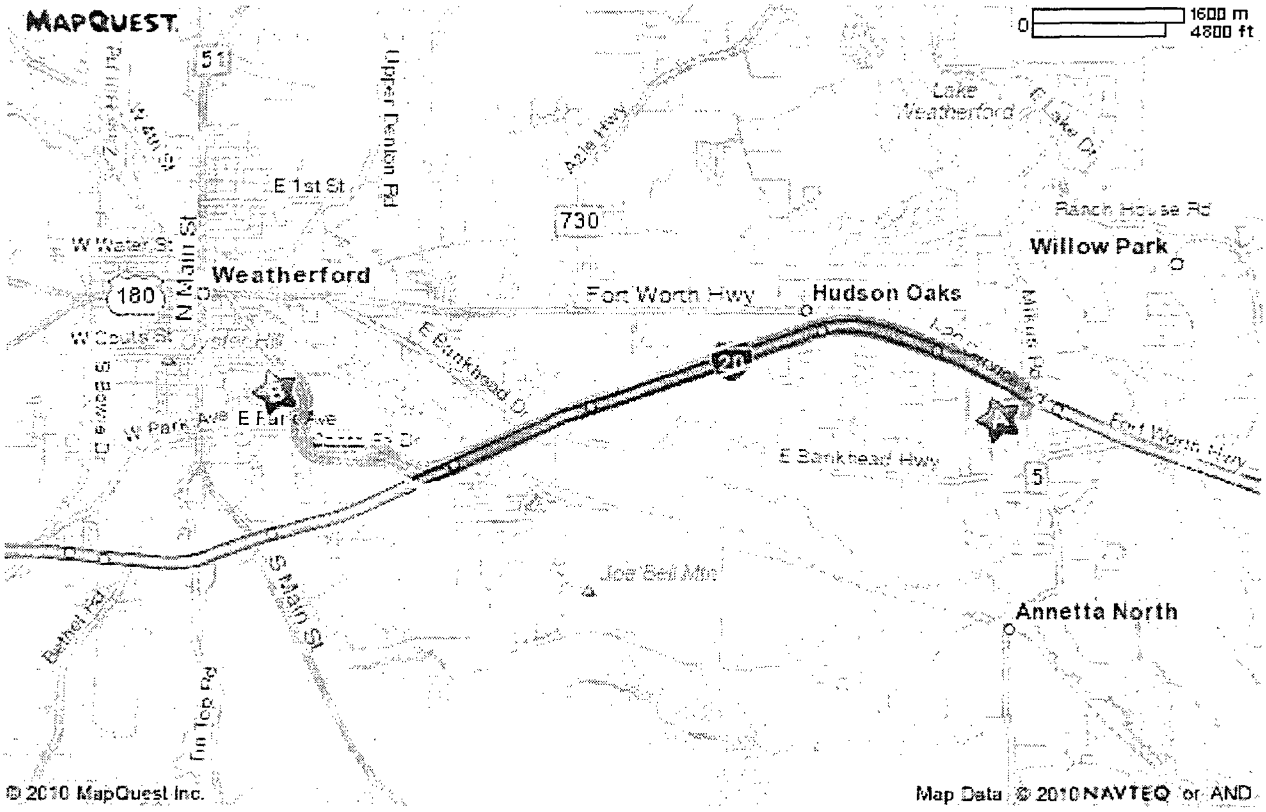
Hospital Name	Weatherford Regional Medical Ctr.
Hospital Address	713 E. Anderson St. Weatherford, TX 76086
Hospital Phone Number	(817) 341-2273

Map to Hospital (see next page)

TCEQ Contacts

TCEQ PA/SI Program Manager:	Melissa Cordell - Austin, Texas Phone: Work (512) 239-2473
TCEQ Central Office Health & Safety Representative:	Omar Valdez - Austin, Texas Phone: Work (512) 239-6858 Cell (512) 577-1155
TCEQ Field Health & Safety Representative	Sugam Shrestha - Austin, Texas Phone: Work (512) 239-4136

Figure 1



Map to Nearest Hospital

A. 117 Circle Court Drive
Willow Park, TX 76087

B. Weatherford Regional Medical Center
713 E. Anderson St.
Weatherford, TX 76086

1. Start out going south on CIRCLE COURT. toward CIRCLE DRIVE.
2. Turn LEFT onto CIRCLE DRIVE.
3. Turn LEFT onto DEER POND DRIVE
4. Turn LEFT onto ANNETTA ROAD/FM 5. Continue to follow FM 5.
5. Turn LEFT onto FORT WORTH HWY/E I-20 SERVICE RD.
6. Merge onto I-20 W/US-80 W via the ramp on the LEFT.
7. Take the CLEAR LAKE ROAD/FM-2552 N/SANTA FE DRIVE exit, EXIT 409.
8. Turn RIGHT onto CLEAR LAKE RD/SANTA FE DRIVE/FM 2552. Continue to follow SANTA FE DRIVE/FM 2552.
9. Turn LEFT onto E. ANDERSON STREET.
10. WEATHERFORD REGIONAL MEDICAL CENTER at 713 E. ANDERSON STREET is on the RIGHT.

SECTION 1

INTRODUCTION

PURPOSE AND POLICY

The purpose of this health and safety plan is to establish personnel protection standards and mandatory safety practices and procedures for work conducted for screening site inspections (SSI) under the Texas Commission on Environmental Quality (TCEQ) Preliminary Assessment/Site Investigation (PA/SI) program. The plan assigns responsibilities, establishes standard operating procedures, and provides for contingencies that may arise while field work is being conducted at the Circle Court Groundwater site (the Site) in Willow Park, Texas.

All personnel who engage in field project activities at the site must be familiar with this plan and comply with its requirements. The provisions of the plan are mandatory for all TCEQ field personnel on this project.

PROGRAM DESCRIPTION

This screening site inspection will be conducted in conformance with the requirements of the revised Hazard Ranking System (HRS) 40 CFR Part 300; Final Rule, dated December 14, 1990. TCEQ Central Office staff recently completed collecting information needed to prepare a work plan and this health and safety plan. TCEQ Central Office staff personnel may visit the site to assist in executing the work plan and/or conduct inspection activities. Activities that will be conducted during the site visit include: site reconnaissance, interviews with any site personnel, and collection of soil and groundwater samples. The anticipated time frame for the execution of all the field work is March 8-11, 2010. This health and safety plan pertains to activities performed while executing the work plan.

SITE INFORMATION

Site: Circle Court Groundwater

Location: The Circle Court Groundwater site is located at 117 Circle Court, 100 yards north-northwest of the intersection of Circle Drive and Circle Court in Willow Park, Parker County, Texas.

Mailing Address: 516 Ranch House Road, Willow Park, TX,76087

Proposed date of field work: March 8-11, 2010

Hazard Assessment: ___ High ___ Medium _X_ Low

___ None ___ Unknown

Site description: The Site is designated as contaminated groundwater in the Paluxy Aquifer originating from an unknown source. The surface location of the Site is the Willow Springs Oaks pump station, part of the active Willow Park Municipal System public water supply (PWS). The pump station is located at 117 Circle Court, 100 yards north-northwest of the intersection of Circle Drive and Circle Court in Willow Park, Parker County, Texas. A 15-acre vacant wooded lot borders the pump station on the north. Single-family residences immediately surround the Site on the south, west and east sides. The pump station is fenced with an access gate at the Circle Court entrance. Facilities at the pump station include one active well and one inactive well, hypochlorination equipment, two ground storage tanks, an elevated storage tank, three hydropneumatic storage tanks and three service pumps. Trichloroethene (TCE) was detected in groundwater samples from the Willow Park Municipal System well in 2006. Follow-up groundwater sampling from nine private wells in the area revealed concentrations of TCE (above laboratory detection limits) in samples collected from five of the private water wells.

SCOPE OF WORK SUMMARY

Personnel will be collecting groundwater and soil samples from the Site and off-site locations in the vicinity over four days in March 2010. Day 1 will consist of travel to the City of Willow Park and collecting six (6) soil samples. Days 2, 3 and 4 will consist of collecting twenty-six (26) groundwater samples from area PWS and private wells. All samples will be grab samples, and all samples will be collected according to the procedures outlined in the PA/SI Quality Assurance Project Plan (Document Number 201002.0).

SITE/CHEMICAL CHARACTERISTICS

Chemical type(s):	_X_ Liquid	___ Solid	___ Sludge	___ Gas
Characteristic(s):	___ Corrosive	___ Ignitable	___ Radioactive	
	___ Volatile	_X_ Toxic	_X_ Reactive	
	_X_ Unknown	___ Other		

Summary of known wastes:

Known wastes associated with the Site, the surface location of the Site or the planned sampling locations include trichloroethene, previously detected in the groundwater, and sodium hypochlorite, used in the disinfection of drinking water.

Unusual features (surface impoundment/tank integrity, power lines, terrain, etc.):

There are no known unusual features associated with the Site, the surface location of the Site or the planned sampling locations. General hazards include but are not limited to: tripping where the ground may be uneven or where objects protrude or are hidden, punctures from objects protruding from the surface and bites from animals.

Current status of site:

The Willow Park Municipal System is currently active. Employees access the Site periodically to collect water samples and perform routine equipment maintenance and other duties associated with maintaining a public water system.

SECTION 2

KEY PERSONNEL

Table 3.1 describes the responsibilities of all staff and on-site personnel associated with this project. The names of individuals associated with this project are listed below:

TCEQ PA/SI Program Manager:	Melissa Cordell, Austin, Texas
Staff Safety Officer:	Omar Valdez, Austin, Texas
Project Manager:	Nancy Johnson, Fort Worth, Texas
Assistant:	Gary Hazelwood, Tyler, Texas
Assistant	April Palmie, Austin, Texas
Site Safety Officer:	Sugam Shrestha, Austin, Texas

Personnel - The Project Manager designates the Site Health and Safety Officer who will be responsible to see that the site work is performed in a manner consistent with the Health and Safety Plan (HASP). The Site Health and Safety Officer will be responsible for Health and Safety briefings before each daily on-site inspection. **The Project Manager or the Site Health and Safety Officer may temporarily suspend field activities if health and safety of personnel are endangered. The Project Manager or the Site Health and Safety Officer may temporarily suspend an individual from the field activities for infractions of the HASP.**

Table 3.1
Staff and On-site Personnel

Title	General Description	Responsibilities
PA/SI Program Manager/ Deputy	Reports to upper-level management. Has authority to direct site investigation activities. Assumes responsibility of meeting all PA/SI program goals/objectives.	Prepares, organizes, and provides program support material. Reviews/approves the project Work Plan, Health and Safety Plan, and the Quality Assurance Project Plan. Appoints adequate number of field team members to conduct sampling activities safely. Briefs the Project Manager on his specific duties. Ensures, through the Staff Safety Officer, that safety and health requirements are met. Serves as the liaison with the Region VI EPA Representative.
Staff Safety Officer	Advises the PA/SI Program Manager on all aspects of health and safety. Reviews Health and Safety Plans submitted to Central Office.	Advises the PA/SI Program Manager on all health and safety issues. Reviews all project Health and Safety Plans to assure proper clothing and protective equipment are identified. Ensures that the proper protective clothing and safety equipment are stored and available for the field investigation efforts. Selects protective clothing and equipment
Site Safety Officer	Advises the Project Manager on all aspects of health and safety. Assures proper field safety is implemented according to the project Health and Safety Plan.	Ensures that entry and exit controls at the site access control points are in place and maintained. Periodically inspects protective clothing and equipment. Confirms each team member's suitability for work based on a physician's recommendation. Monitors the work parties for signs of stress, such as cold exposure, heat stress, and fatigue. Monitors onsite hazards and conditions. Implements the health and safety plan. Conducts periodic inspections to determine if the project Health and Safety Plan is being followed. Enforces the "buddy" system.

Table 3.1
Staff and On-site Personnel
(Continued)

Title	General Description	Responsibilities
Site Safety Officer (Continued)		Notifies, when necessary, local public emergency officials in coordination with on-site representatives. Coordinates emergency medical care. Ensures setup of decontamination lines and solutions appropriate for the type of chemical contamination on the site. Controls decontamination of all equipment, personnel, and samples from the contaminated areas. Ensures proper disposal of contaminated clothing and materials. Advises medical personnel of potential exposures and consequences. Notifies emergency response personnel by telephone or radio in the event of an emergency. Ensures that all personnel can appropriately use the equipment.
Site Investigation Manager	Prepares Work Plan, and Health and Safety Plan for review/approval. Responsible for field investigation phase of the project.	Obtains permission for site access from the property owners or their representatives. Coordinates all field activities with the appropriate local community officials. Prepares the Work Plan and Health and Safety Plan for Central Office review/approval. Ensures that the work plan is complete and submitted to meet schedule requirements. Executes the Work Plan, Health and Safety Plan, and assures QAPP requirements are met according to the project schedule. Enforces safety procedures through the Site Safety Officer. Documents field activities and sample collection efforts. Serves as a liaison with the on-site client representative.

Table 3.1
Staff and On-site Personnel
(Continued)

Title	General Description	Responsibilities
Project Manager (Continued)		Prepares and submits the final report and required support documentation for Central Office approval.
Field Team Members	Perform field activities as instructed by Project Manager.	Safely complete the on-site tasks required to fulfill the work plan. Notify Site Safety Officer or supervisor immediately of suspected or noted unsafe conditions observed in the field. Take precautions necessary to prevent injury to themselves and other employees. Read, sign-off, and comply with the project Health and Safety Plan before entering the site for field activities. Maintain visual contact between partners (buddy system). Perform only those tasks they believe they can do safely. Immediately report to the field team leader any accidents and/or unsafe conditions, or any deviations from the Health and Safety Plan.

SECTION 3

SAFETY AND HEALTH RISK ANALYSIS

RESPIRATORY HAZARDS

Respiratory hazards may exist on site from hazardous materials in potentially contaminated soil or groundwater, which could be inhaled during sampling activities. Protection from respiratory hazards will be discussed in Section 4 of this Health & Safety Plan.

CHEMICAL HAZARDS

Chemical hazards can exist when liquid, vapors, or soil samples contact human tissue. Every effort will be made to avoid inadvertent contact with the chemical media at the Site. Since ground water and soil samples will be collected, protective equipment will be used to avoid physical contact. The chemical hazards at the site include groundwater and soil which may contain hazardous substances detected during previous investigations.

Information on the contaminants that may be encountered at the site is presented in Section 1 and Appendix B. The site may contain other hazardous chemicals that may release hazardous or toxic vapors. The site will be approached with caution, and any moving or handling of drums, containers, or equipment will be avoided.

ROUTES OF EXPOSURE

The field team may be exposed to contaminated materials through inhalation, ingestion, and/or skin and eye contact.

- Respiratory system contact with hazardous airborne materials can occur. If these conditions exist, field work will be conducted upwind, proper protective equipment will be used, or the site will be evacuated.

- Eye contact with solid samples that are contaminated can occur when a worker does not wear safety glasses while samples are being taken or handled.

- Skin contact with contaminated solid or liquid samples can occur when a worker does not wear gloves and protective clothing during sampling activities.

- Gastrointestinal system contact with samples can occur when workers do not observe personal hygiene rules designed to reduce the chance of ingesting site contaminants (i.e., wash hands before smoking, eating, or drinking).

RADIATION HAZARD

No radiation hazards are expected as can be discerned from process knowledge and historical sampling data.

PHYSICAL HAZARDS

Physical hazards include, but are not limited to snakes, alligators, mosquitoes, fire ants, and poison ivy. Field work should be performed using all normal safety precautions. The Health and Safety Plan guidelines concerning avoiding physical hazards will be followed, as a minimum. In addition,

- ➤ Unnecessary moving or opening any heavy or bulky containers, drums, bags, etc., will be avoided;
- ➤ The "buddy" system will be used at all times;

Heat Stress

If elevated temperatures are encountered, heat stress may occur. Field work may be performed when daytime temperatures are often high. Water will be available on site, and the Site Safety Officer will encourage workers to drink frequently to prevent dehydration and stay in shaded areas whenever possible. In addition, workers should adhere to the recommended work/rest schedule determined by the Site Safety Officer. Depending on work levels and outside temperatures, each individual should monitor his body temperature and note indications of heat stress as they onset. The "buddy" system will be used at all times to check each other for the first symptoms of heat stress.

Heat stress/stroke control. The TCEQ Site Safety Officer will set work and break schedules depending on the outside temperature. General guidelines for heat stress control while sampling include rest breaks in the shade for at least 10 minutes out of every hour during elevated temperatures. Rest time shall also include fluid replacement with water or electrolytes fluids.

Heat stress/stroke monitoring. The TCEQ Site Safety Officer will monitor workers who are performing strenuous activities in elevated temperatures for heat stress/ stroke. Monitoring will be conducted at the Site Safety Officers discretion, worker's request, or at the beginning of a rest period. The monitoring shall also be conducted when workers performance or mental status significantly changes. The heat stress monitoring plan may include:

- Measurement of worker heart rate, OR
- Measurement of body temperature, and
- Observation of the field team members for signs and symptoms of heat injury.

Heart rate (HR) will be measured by the radial pulse for 30 seconds as early as possible during the resting period. The HR at the beginning of the rest period should **not exceed 100 beats per minute**. If the HR exceeds 100 beats per minute, the next work period will be shortened by one third while the length of the rest period remains the same.

Body temperature will be measured using an oral thermometer. Worker **body temperature should not exceed 99.6° F**. If the worker's body temperature exceeds this, the work period will be shortened by one third while the length of the rest period remains the same. No person will be permitted to wear a semi-permeable or impermeable garment **when body temperature exceeds 100.6 ° F.**

Table 4.1 presents suggested frequencies for heat monitoring. Heat stress monitoring will be performed by a person with a current first-aid certification. Workers that exhibit signs of heat injury will be allowed to rest until the signs are no longer observable. In Appendix E, the heat stress handouts are included to provide symptoms of heat stress and emergency medical procedures for treating heat exhaustion and heat stroke.

Table 4.1 - Suggested Frequency of Physiological Monitoring for Fit and Acclimatized Workers[1]

Temperature	Normal Work Ensemble[2]	Impermeable Ensemble
90°F (32.2°C) or above	After each 45 minute work period	After each 15 minutes work period
87.5-90°F (30.8-32.2°C)	After each 60 minutes work period	After each 30 minutes work period
82.5-87.5°F (28.1-30.8°C)	After each 90 minutes work period	After each 60 minutes work period
77.5-82.5°F (25.3-28.1°C)	After each 90 minutes work period	After each 90 minutes work period
72.5-77.5°F (22.5-25.3°C)	After each 150 minutes work period	After each 120 minutes work period

[1] For moderate work, e.g. walking about with moderate lifting and pushing.
[2] A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

Cold Injury

Because the field sampling activities will occur during the winter months, all field personnel should be especially alert to the possibility of cold injuries, which are most likely to occur when an unprotected individual is exposed to cold temperatures. Temperature, humidity, precipitation, and wind all play roles in the development of cold injuries. The most serious cold injuries are hypothermia and frostbite. Dehydration can also occur if insufficient fluids are not taken as in hot weather. In cold weather, the individual may not be as aware of the problem since perspiration evaporates rapidly or is absorbed by layers of heavy clothing.

Individuals with a history of cold injuries (i.e., frostbite) have a higher-than-normal risk of recurrence, not necessarily involving the part previously injured. Individuals with prior cold injuries should notify the Health and Safety Officer and use the "buddy" system to monitor early detection of cold injury symptoms. In Appendix E, cold stress handouts are included to provide observable symptoms and emergency medical procedures for treating hypothermia and frostbite.

Snake Hazards

It is likely that snakes may be encountered at the Site. Long pants and high boots or snake guards will be worn during certain site activities to avoid a snake hazard. Never reach into a bushy area before checking for snakes by probing the area with a stick and listening for movement in the brush. Workers will use caution when working in areas where snakes may be present.

If a worker is bitten by a poisonous snake, the following steps should be taken:

- Attempt to identify the type of snake and its location,
- Keep the victim calm and minimize movement,
- Apply ice to the area bitten, and
- Transport victim to the nearest medical facility.

SAFE WORK PRACTICES

To ensure a strong safety awareness program during the sampling inspection, personnel must have adequate training. The Health and Safety Plan must be read by each member of the field team before conducting field activities and briefed to the field team at the beginning of each sampling day. Safety awareness must be developed and communicated to all members of the field team. All members of the field team will adhere to the following safety requirements while conducting field work for this sampling effort:

- No smoking, eating, or drinking carbonated beverages while at the site.
- Do not carry matches, lighters, or other ignition sources on the site.
- Facial hair will not be allowed where respirators contact the face.
- Contact lenses will not be worn during field work.
- Alcoholic beverages will not be permitted in State vehicles.
- Always use the "buddy" system while performing field work.
- Avoid walking through puddles or stained soil.
- Discovery of unusual or unexpected conditions will result in immediate evaluation and reassessment of site conditions and health and safety practices.

- A safety briefing will be performed each day prior to on-site work beginning.
- Other safety meetings may be conducted, as necessary.
- Take precautions to reduce injuries from field equipment and other tools.

All personnel will check their equipment at least two weeks before going into the field in case replacements are necessary. For respirator users, the correct corresponding cartridge or canister for the user's respirator will be verified before entering the site.

SECTION 4

PERSONAL PROTECTION EQUIPMENT AND MONITORING

RESPIRATORY PROTECTION

The chemicals that may be present at the site are listed in Table 6-1. No airborne chemical vapors or other COCs are expected as can be discerned from process knowledge and historical sampling data. As precaution, during the sample collection efforts, warning symptoms such as headaches and nausea and observations of unusual vapors, mists, or clouds, will require using readily available respiratory protective equipment or immediate evacuation of the area. In particular, if suspended particulates are observed in the air while sampling of the tailings pile takes place, personnel collecting or directly observing the collection of samples shall wear a personal respirator with a high-efficiency particulate air (HEPA) filter. Visual inspection will be used to detect the presence of any remaining chemicals by noting stained or vegetation stressed areas during the initial walk through.

PERSONAL PROTECTION

The required personal protection clothing will be worn during on-site inspections, especially during all sampling events, except where down-grades are acceptable:

Level C (Modified)

- Coveralls (i.e., Tyvek), neoprene, PVC, or rubber boots (steel toe), inner vinyl or latex surgical gloves, outer neoprene work gloves, full-face respirator with organic and particulate filters.
- Coveralls will be taped at wrists and ankles. Respirator cartridges to be used will bear NIOSH/MSHA approvals. Respirator cartridges will be changed once daily or when recommended exposure is reached to minimize the potential for break-through. If break-through occurs, cartridges must be changed.

If a down-grade is deemed acceptable:

Level D

- Tyvek (non-chemical resistant) coveralls, neoprene, PVC, rubber, or leather work boots (steel toe), optional inner vinyl or latex surgical gloves, outer neoprene work glove, optional goggles or face masks, and a hard hat.

MEDICAL SURVEILLANCE

Each field member must be a current participant in the TCEQ Health Monitoring Program, and must have already had their initial physical examination prior to entering this or any site where a potential exists for exposure to hazardous chemicals.

Each team member will acknowledge that they have had a current annual physical by signature on the Plan Acceptance Form and that they are medically fit to perform team tasks as assigned. If there are any medical restrictions on a team member's utilization, these restrictions must be provided in writing to the Site Safety Officer as noted by a physician as soon as possible before the field work begins. These restrictions will be complied with at all times while performing team tasks. If the team member cannot perform the task as required, another team member will be selected to perform the task.

SITE SPECIFIC TRAINING

The Site Safety Officer will be responsible for developing a hazard awareness briefing for all TCEQ personnel that are to perform team member tasks on the site, and other visiting personnel, as necessary. If other personnel visit the site during the sampling inspection and wish to participate, they will be required to review the Health and Safety Plan and/or receive a hazard awareness briefing from the Site Safety Officer before entering the site. This training will be acknowledged by signature of the visiting personnel on the Plan Acceptance Form (Appendix A). A daily safety meeting will be held prior to entering the site each day and a Site Safety Briefing Form completed (See Appendix B). The safety meeting will consist of the following topics:

SITE SAFETY BRIEFING (Held Each Day)

- Roll call - identify the team member responsible for site safety and health. Assure the Plan Acceptance Form has been signed by each team member.
- Discuss safety, health, and other issues that may effect the tasks assigned.
- Discuss/review proper use of personal protective equipment.
- Review work practices by which the employee can minimize risk from hazards.
- Discuss safe operation of engineering controls and equipment used on the site.
- Review potential chemicals and acute effects of the chemicals at the site.
- Review evacuation routes, signals, and emergency evacuation procedures.
- Review decontamination procedures, assign decontamination tasks.
- Assign designated area to meet in case work area must be evacuated.
- Review "buddy" system procedures.

The Site Safety Officer shall be familiar with the operation, calibration, and limitations of all field monitoring equipment. In addition, the field team should have the following health and safety items readily available:

- Copy of the Health and Safety Plan,
- Cellular Phone & Emergency Numbers,
- First aid and snake bite kits, including ice,
- Emergency eyewash bottle,
- Air sampling/monitoring equipment (photoionization detector, etc,),
- Oxygen/combustible gas indicator (as required),
- Fire extinguisher, and
- Distilled water (for eyewash bottle refill and decontamination procedures).

SECTION 5

FREQUENCY AND TYPES OF AIR MONITORING

If the Project Manager or Site Safety Officer determines that air monitoring is necessary, two types will be performed at this site: monitoring for combustible hydrocarbon emissions and for volatile organic vapors. The first instrument to be used on site is the O_2/combustible gas indicator (CGI), or explosimeter. The lower explosive limit (LEL) for combustible gases will be monitored initially before any other instruments are employed, since volatile ignitable gases may be present. Dangers from these gases include asphyxiation to entering a potentially explosive atmosphere. The **action level** for LEL is established as **>10% LEL**. Therefore, LELs of 10% or greater are cause to stop work and evacuate the area upwind until levels are determined below this action level.

If the LEL is established as < 10%, monitoring for organic vapors/gases will be conducted as the second type of air monitoring using a photoionization detector (PID) instrument. Field instruments must be calibrated prior to use at the site according to the manufacturer's specifications and as outlined in the QAPP. Monitoring of the potential breathing zone around the sampling areas will be performed during the sampling activities as well as periodically during other on-site activities. An **action level** of **10 ppm above background** will be used for **volatile organics** at all sampling areas because of the potential for encountering unknown chemicals. If 10 ppm above background is encountered on the air monitoring equipment at a sampling location, the Site Safety Officer will be immediately contacted to reevaluate safety equipment requirements or whether the site will be evacuated until the vapors are identified or dissipate.

The need for air monitoring equipment and frequency will be determined on a site-specific basis by anticipated respiratory concerns at the area (i.e., background samples taken off-site may not need air monitoring equipment).Table 6.1 lists the chemicals that **may be present** in the Circle Court Groundwater site and the TLV, PEL, and other pertinent information for each chemical. Table 6.2 lists the same information for the decontamination and preservation chemicals which may be used at this site.

AIR MONITORING EQUIPMENT CALIBRATION AND MAINTENANCE

All monitoring instruments will be calibrated daily in accordance with the instrument specific instruction and maintenance manuals. During the daily course of the sampling event, the Site Safety Officer is responsible for perform calibration and maintenance of all air monitoring equipment according to the manufacturers instruction. Calibration data/time/equipment comments will be noted in the project field notebook.

MONITORING REQUIREMENTS AND INSTRUMENT LIMITATIONS

The TCEQ Site Safety Officer and TCEQ personnel shall operate the air monitoring equipment as specified in the manufacturer's instruction booklet. The air monitoring devices will be used only for safety screening purposes during site activities.

Table 6.1 Selected chemicals that may be present at the Circle Court Groundwater site (From NIOSH & ACGIH Pocket Guides)

Possible Chemical Contaminants	**NIOSH REL** (Recommended exposure level for 10 hr wk day/40 hr week) ST (short term exposure level/15 minutes)	**PEL** (Permissible exposure limit for 8 hr days in a 40 hr week) ST (short term exposure level/15 minutes)	**TLV** (Threshold Limit Values for 8 hours) **only listed if more stringent than PEL	**IDLH** (Immediate Dangerous to life or health concentrations	**Symptoms of Exposure** (inhalation; skin absorption)
Trichloroethylene	25 ppm TWA	100 ppm TWA	50 ppm TWA	1000 ppm	Eye and skin irritation; headache, nausea

ppm = Parts per million
ca = Carcinogen
a/TLV-TWA = Threshold limit value, time weighted average. OSHA-enforced average air concentration to which a worker may be exposed for an 8-hour workday without harm.
b/PEL = Permissible exposure limit. Average air concentration (same definition as TLV, above) as recommended by the American Conference of Governmental and Industrial Hygienists (ACGIH).
c/IDLH = Immediately dangerous to life or health. Air concentration at which an unprotected worker can escape without debilitating injury or health effects. Expressed as ppm unless noted otherwise.
© = denotes Ceiling limit

Table 6.2 Chemicals of Record Used for Field Investigations

Chemical	TLV a/	(OSHA) PEL b/	Odor Threshold (ppm)	IDLH c/ (ppm)	Comments
Hexane	50	500		500	Calibration for HNU PI-101 photoionization detector. No anticipated problems since hexane in cylinder is only 0.14 percent by volume with air.
Nitric Acid	2	2		100	Very corrosive sample preservative agent. Avoid contact with skin, eyes, and clothing. Store bottle in an upright secure position. <u>Do not</u> preserve water samples suspected of containing cyanide compounds.
Hydrochloric Acid	(C),5	(C),5	1-5	100	Very corrosive sample preservative agent. Avoid contact with skin, eyes, and clothing. Store bottle in an upright secure position. <u>Do not</u> preserve water samples suspected of containing cyanide compounds.
Isopropanol	400			12,000	Decontamination fluid. Wear gloves when cleaning equipment.

ppm = Parts per million
ca = Carcinogen
a/TLV-TWA = Threshold limit value, time weighted average. OSHA-enforced average air concentration to which a worker may be exposed for an 8-hour workday without harm.
b/PEL = Permissible exposure limit. Average air concentration (same definition as TLV, above) as recommended by the American Conference of Governmental and Industrial Hygienists (ACGIH).
c/IDLH = Immediately dangerous to life or health. Air concentration at which an unprotected worker can escape without debilitating injury or health effects. Expressed as ppm unless noted otherwise.
© = denotes Ceiling limit

SECTION 6

ACCIDENT PREVENTION AND CONTINGENCY PLAN

ACCIDENT PREVENTION

All field personnel will receive health and safety training prior to the initiation of any site activities. On a day-to-day basis, individual personnel should be constantly alert for indicators of potentially hazardous situations and for signs and symptoms in themselves and others that warn of hazardous conditions and exposures. Rapid recognition of dangerous situations can avert an emergency. Before beginning the site investigation, a meeting will be held to discuss accident prevention (see Section 5, Site Safety Briefing). The discussion should cover but not be limited to:

- Tasks to be performed; time constraints (e.g., rest breaks);
- Hazards that may be encountered, including their effects, how to recognize symptoms or monitor them, concentration limits, or other danger signals; and emergency medical procedures.
- Emergency evacuation procedures.

Buddy System

The "buddy" system will be used at all times by all TCEQ field personnel while performing work related tasks on site. All activities must be conducted with a partner (buddy) who can:

- Provide his or her partner with assistance;
- Observe his or her partner for signs of chemical or weather exposure; and
- Notify the Site Safety Officer or others if emergency help is needed.

CONTINGENCY PLAN

Emergency Procedures

In the event that an emergency develops onsite, the procedures delineated herein are to be immediately followed. Emergency conditions are considered to exist if:

- Any member of the field crew is involved in an accident or experiences any adverse effects or symptoms of exposure while on site, or
- A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

Chemical Exposure

If a member of the field crew demonstrates symptoms of chemical exposure, the procedures outlined below should be followed:

- Another team member (buddy) should remove the individual from the immediate area of contamination. The buddy should then notify the Site Safety Officer of the chemical exposure. The Project Manager should contact the appropriate emergency response agency.

- If the chemical is on the individual's clothing, the chemical should be neutralized or removed (if it is safe to do so).

- If the chemical has contacted the skin, the skin should be washed immediately with copious amounts of water.

- In case of eye contact, the emergency eye-wash solution should be used. Eyes should be washed for at least 15 minutes using available distilled water.

- All chemical exposure incidents must be reported to the Region/Central Office Staff Safety Offices. The Project Manager is responsible for reporting the chemical exposure incident and assist the individual's supervisor in submitting a written report (see Appendix A).

Personal Injury

In case of personal injury at the site, the following procedures should be followed:

- A team member should signal the other team member that an injury has occurred.

- A field team member trained in first aid can administer immediate treatment to the injury.

- The victim should then be stabilized and transported (if applicable) to the nearest hospital or medical center.

- The Project Manager is responsible for making certain that an accident report form is completed and submitted to the Region and Central Office Staff Safety Offices. Follow-up action should be taken to correct the situation that caused the accident.

Evacuation Procedures

- The Site Safety Officer will determine whether an evacuation is necessary.

- All personnel in the work area should evacuate the area and meet in the pre-designated area.

- Account for all personnel. Wait for further instructions from the Site Safety Officer.

SECTION 7

SITE-SPECIFIC DECONTAMINATION PROCEDURES

Prior to leaving the site, personnel protective and sampling equipment will be decontaminated. Decontamination procedures will be conducted as follows:

- Remove and wash goggles or safety glasses (if used),
- Remove and wash chemical protective boots, gloves,
- Wash sampling equipment to remove gross contamination, and
- Wash hands and face.

Protective gloves will be placed in garbage bags and disposed of appropriately at the conclusion of site activities. Sampling equipment will be placed in plastic bags for final decontamination at *the conclusion of site activities.*

PERSONNEL DECONTAMINATION PROCEDURES

The TCEQ field team will establish an on-site decontamination station. An area will be set up during initial field activities prior to any sampling event. The decontamination station will have provisions for collecting disposable protective equipment; for washing boots, gloves, field instruments, sampling tools (if required); and for washing hands, face, and other exposed body parts. Investigation derived waste (IDW) from decontamination will be properly disposed in accordance with EPA guidelines outlined in the EPA/540/G-91/009, May 1991 handbook.

Decontamination equipment will include, as necessary:

- Plastic buckets, pails, and scrub brushes
- Non-phosphate detergent
- Isopropyl alcohol
- Paper towels
- Plastic garbage bags, sheets of plastic
- Deionized and potable water.

SECTION 8

DOCUMENTATION AND NOTIFICATION

LOGBOOK DOCUMENTATION REQUIREMENTS

Implementation of the provisions of the Health and Safety Plan will be recorded in the field log book. Information to be recorded shall include:

- Weather conditions at the time of the inspection (daily entry),
- Names of the personnel on-site (daily entry),
- Levels of personal protective equipment worn by the field personnel (specifically note conditions or rational for down- or up-grading PPE),
- Monitoring instrument readings,
- Subjects discussed during site health and safety briefings, and
- All safety violations.

A Health and Safety Checklist has been included in Appendix C to assist the Site Safety Officer in assuring that appropriate safety consideration have been covered in the daily safety briefing.

EPA NOTIFICATION OF IMMINENT DANGER TO THE GENERAL PUBLIC

If there is an imminent danger that the general public may come into direct contact with hazardous substances or wastes, which are readily accessible on-site, the Project Manager will notify the Project Manager who will notify the EPA no later than one (1) day after the inspection team returns from the site. Written notification will follow any verbal communication in regard.

SECTION 9

CONFINED SPACE ENTRY

A "Confined Space" means that a space:

1) is large enough and so configured that an employee can bodily enter and perform assigned work;
2) has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and
3) is not designed for continuous employee occupancy.

Should confined spaces be required to be inspected for a SSI, the Site Project Manager will be responsible for evaluating the site to determine if any confined spaces meet the definition of a permit-required confined space. "Permit-required confined space" means a confined space that has one or more of the following characteristics:

1) contains or has a potential to contain a hazardous atmosphere;
2) contains material that has the potential for engulfing an entrant;
3) has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
4) contains any other recognized serious safety or health hazard.

If permit-required confined spaces are observed on site and are required to be investigated, the Site Project Manager, or any other team member, will not enter these spaces and will notify the Staff Health and Safety Officer, who will arrange for certified personnel who can work in permit-required confined spaces.

APPENDIX A

Plan Acceptance Form, TCEQ Reporting Procedures Memo, Accident Report, and Supervisors Investigation of Employee's Accident/Incident Form

PLAN ACCEPTANCE FORM

SUMMARY OF ACTIVITIES

1. Initial site reconnaissance, designating sample locations, verify integrity of groundwater monitor wells.

2. Source sampling of sediments in inactive surface impoundments.

3. Background and target sediment sampling.

4. Background and attribution ground water sampling.

ACCEPTANCE

I have read the Health and Safety plan (or been briefed on the hazards) for Screening Site Inspection (SSI) field work to be conducted at the Circle Court Groundwater site located in Willow Park, Texas, and agree to abide by the rules and guidelines contained therein. I acknowledge that I have had a current annual physical within the last 12-month period from the date signed below, and am medically cleared to perform my tasks as outlined.

Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date

INSTRUCTIONS FOR EMPLOYERS FIRST REPORT OF INJURY OR ILLNESS (TWCC-1)

Type (or print in black ink) each item on this form. Failure to complete each item may delay the processing of the injury claim.

Article 8308 - 5.05, Texas Workers' Compensation Act, requires an Employer's First Report of Injury or Illness (Form TWCC - 1 (2-91)) to be filed with the Workers' Compensation Insurance Carrier not later than the eighth day after the receipt of notice of occupational disease, or the employee's first day of absence from work due to injury or death. A copy of this report must be sent to the employee or the employee's representative. For purposes of this section, a report is filed when personally delivered, or postmarked. Send the specified copies to your **Workers' Compensation Insurance Carrier** and the injured employee. ***Employers - Do not send this form to the Texas Workers' Compensation Commission, unless the Commission specifically requests a direct filing.**

If a report has not been received by the carrier, the employer has the burden of proving that the report was filed within the required time frame. The employer has the burden of proving that good cause existed if the employer failed to file the report on time.

An employer who fails to file the report without good cause may be assessed an administrative penalty not to exceed $500.00. An employer who fails to file the report without good cause waives the right to reimbursement of voluntary benefits even if no administrative penalty is assessed.

Once the employer has completed all information pertaining to the injury the employer should maintain the copy of this report to serve as the Employer's Record of Injury required by Article 8308 -5.04. Send the specified copies to your **Workers' Compensation Insurance Carrier** and the injured employee. ***Employers - Do not send this form to the Texas Workers' Compensation Commission, unless the Commission specifically requests a direct filing.** The Commission's Health and Safety Division will use data from this report for the Job Safety Information System established in Article 8308 - 7.03 of the Texas Workers' Compensation Act.

This report may not be considered admission or evidence against the employer or the insurance carrier in any proceeding before the Commission or a court in which facts set out in the report are contradicted by the employer or insurance carrier.

"SPECIAL INSTRUCTIONS FOR CERTAIN ITEMS"

Items 2,7,8: Article 8308 - 2.13(e), Texas Workers' Compensation Act requires the Commission to maintain information as to the race, ethnicity and sex on every compensable injury. This information will be maintained for non-discriminatory statistical use.

Item 4: If no home phone, please provide a phone number where the employee can be reached.

Items 5,15,17, 26,29,30: Enter data in month, day, year format. Example: 08-13-54.

Item 18: List nature of accident or exposure, e.g., fall from scaffold, contact with radiation, etc. If occupational disease, so state.

Item 19: List specific body part, e.g., chin, right leg, forehead, left upper arm, etc. If more than one body part is affected, list each part.

Item 20: Describe in detail (1) the events leading up to the injury/illness, (2) the actual injury, e.g., cut left forearm, broken right foot, etc., and (3) the reason(s) why accident/injury occurred. Use an additional sheet of paper if necessary.

Item 22: State the exact work-site location of the injury, e.g., construction site, office area, storage area, etc.

Item 24: List object, substance, or exposure that directly inflicted the injury or illness, e.g., floor, hammer, chemicals, etc.

Items 32,33: Enter date in month-year format. Example: 02-56.

Item 37: Enter the number of days or hours that make up a full work week for your employees.

Item 45: Enter the 4-digit primary standard industrial classification code (SIC) of the employer. The primary code is the code which appears in block 5 of Form C-3, "Employer's Quarterly Report" to the Texas Employment Commission.

Item 46: For companies with a single SIC code, the specific code is the same as the primary code. For companies with multiple SIC codes, enter the code that identifies the specific business, activity, or work-site location the employee was working in at the time of the injury. This may or may not be the same as the primary code.

Mail this form to:
STATE OFFICE OF RISK MANAGEMENT
P. O. Box 13777
Austin, Texas 78711

Please read instruction sheet CAREFULLY, giving special attention to items marked with an asterisk (*).

TWCC CLAIM # ______

DIRECTOR'S# ______

EMPLOYER'S FIRST REPORT OF INJURY OR ILLNESS

1. Name (Last, First, M.I.)
2. Sex F ☐ M ☐
3. Social Security Number
4. Home Phone ( )
5. Date of Birth (m-d-y)
6. Does the Employee Speak English? YES ☐ NO ☐ If No, Specify Language
7. *Block no longer used*
8. *Block no longer used*
9. Mailing Address Street or P.O.Box

City State Zip Code County

10. Marital Status Married ☐ Widowed ☐ Separated ☐ Single ☐ Divorced ☐
11. Number of Dependent Children
12. Spouse's Name
13. Doctor's Name
14. Doctor's Mailing Address (Street or P.O.Box)

City State Zip Code

15. Date of Injury (m-d-y)
16. Time of Injury : am ☐ pm ☐
17. Date Lost Time Began (m-d-y)
18. Nature of Injury*
19. Part of Body Injured or Exposed*
20. How and Why Accident/Injury Occurred*
21. Was employee doing his regular job? YES ☐ NO ☐
22. Worksite Location of Injury (stairs, dock, etc.)*
23. Address Where Injury or Exposure Occurred. Name of business if incident occurred on a business site.

Street or P.O. Box County

City State Zip Code

24. Cause of Injury (fall, tool, machine, etc.)*
25. List Witnesses
26. Return to work date/or expected (m-d-y)
27. Did employee die? YES ☐ NO ☐
28. Supervisor's Name
29. Date Reported (m-d-y)

30. Date of Hire (m-d-y)
31. Was employee hired or recruited in Texas? YES ☐ NO ☐
32. Length of Service in Current Position Months ______ Years ______
33. Length of Service in Occupation Months ______ Years ______
34. State Payroll Classification Code
35. Occupation of Injured Worker
36. Rate of Pay at this Job $______Hourly $______Weekly $______Monthly
37. Full Work Week is: ______ Hours ______ Days
38. Last Paycheck was: $______
39. Is employee an Owner, Partner, or Corporate Officer? YES ☐ NO ☒

40. Name and Title of Person Completing Form
Claim Coordinator
41. Name of Agency
42. Agency Mailing Address and Telephone Number
Street or P.O. Box Telephone ( )

City State Zip Code

43. Agency Location Code
___ ___ ___ / ___ ___ ___ / ___ ___ ___
Name of Location: ______

44. Federal Tax Identification Number
45. Primary Standard Industrial Classification Code (SIC)* (4 digit)
46. Specific SIC Code* (4 digit)
47. Comptroller Agency Code ___ ___ ___
48. Workers' Compensation Insurance Company
State Office of Risk Management
49. Policy Number
TXSTATEPOL001
50. Did you request accident prevention services in past 12 months? YES ☐ NO ☐ If yes, did you receive them? YES ☐ NO ☐
52. Number of Hours of Sick Leave Credited to Employee on Date of Injury
51. Signature and Title (READ INSTRUCTIONS ON INSTRUCTION SHEET BEFORE SIGNING)

File original with employer's carrier.
File copy with injured employee.

CARRIER'S CLAIM #________________
TWCC #________________

SUPPLEMENTAL REPORT OF INJURY

DO NOT SEND THIS FORM TO TEXAS WORKERS' COMPENSATION COMMISSION UNLESS REQUESTED.

WHEN AND WHERE TO FILE: ***For all injuries occuring January 1, 1991 or after*** that require a TWCC-1, Employer's First Report of Injury, to be filed, the employer must file by first class mail or personal delivery a Supplemental Report of Injury (TWCC-6) with the employer's workers' compensation carrier and the injured employee: 1) within 3 days after the injured employee returns to work; 2) within 3 days when the employee, after returning to work, has an additional day or days of disability because of the injury; 3) within 10 days after the end of each pay period in which the employee has an increase or decrease of earnings during the time the employee is entitled to temporary income benefits; 4) within 10 days after the employee resigns or is terminated. If the injured employee is no longer employed by the employer, the employee is responsible for providing information to the carrier about amounts of earnings or offers of employment. The employee may use a TWCC-6, Employer's Supplemental Report of Injury for this purpose. **An employee has disability if he/she is unable to work as a result of the injury or has returned to work earning less than pre-injury wages because of the injury.**

EMPLOYEE INFORMATION

1. Employee's Name (Last, First M.I.) and Telephone No. (   )

2. Social Security No.

3. Date of Injury (m-d-y)

4. Employee's Mailing Address (Street or P.O. Box)

City   State   Zip Code

TO EMPLOYER: Based on above rule requirements, check boxes which show reasons for filing Supplemental Report of Injury this (

- ☐ ***employee returned to work*** — Complete Block 5a or 5b; Complete Blocks 6 and 7
- ☐ ***additional day(s) of disability*** — Complete Block 5b; Complete Block 7
- ☐ ***change in weekly earnings after injury*** — Complete Blocks 5a or 5b; Complete Blocks 7 and 8
- ☐ ***employee terminated/resigned*** — Complete Block 5a or 5b; Complete Block 7; Complete Block 9

5. a) If initial filing of TWCC-6, first day of disability due to injury (m-d-y)

5. b) If second or subsequent filing of TWCC-6, give first day of disability due to injury for this period only (m-d-y)

6. Date of Return to Work ________________
(Check box) ☐ Full Duty, Full Pay ☐ Limited Duty: Full Pay ☐ Reduced Pay

7. Weekly and Hourly Earnings at Time of This Report $________ weekly $________ hourly
(Check box) ☐ Same as Preinjury Wages ☐ Increase from Preinjury Wages ☐ Decrease from Preinjury Wages

8. No. of Hours Working Weekly at Time of This Report ________
(Check box) ☐ Increase from Preinjury Hours Worked Weekly ☐ Same as Preinjury ☐ Decrease from Preinjury Hours Worked Weekly

9. If the employee resigns or is terminated, fill in the appropriate section.
☐ Date of Resignation (m-d-y) ________________
☐ Date of Termination (m-d-y) ________________

10. If applicable, eight days of disability began on (m-d-y) [see above definition of disability]

9a. Reason for Resignation or Termination

11. Has injured employee died? If so, give date of death (m-d-y)

12. Was employee on limited duty at time of termination? ☐ Yes ☐ No

EMPLOYER INFORMATION

13. Employer's Business Name

14. Telephone No. (   )

15. Employer's Business Mailing Address (Street or P.O. Box)

City   State   Zip Code

16. Name of Workers' Compensation Carrier for Above Injury

17. The information provided in this report is accurate to the best of my knowledge. It may be relied upon for evaluation of the named employee's eligibility for benefits.

________________________ ________________
Signature and Title of Person Completing Form ☐ Employer ☐ Employee   Date

TWCC 6 (Rev. 7/93)   Rules 120.3, 129.4

TNRCC Supervisor's Report of Employee Injury or Illness

This report is to be completed by the injured employee's supervisor and submitted to Risk Management (MC192) within 3 working days of report of incident.

1. Last Name of Injured	2. First Name	3. M.I.	4. Social Security Number	5. Date of Birth / /
6. Sex ☐ M ☐ F	7. Date Of Employment with Unit / /	8. Position Status: ☐ Full-time ☐ Part-time ☐ Contract		9. Work Location (Bld. or Region)
10. Unit/Section Number	11. Date of Incident / /	12. Time of Incident : a.m. ☐ p.m. ☐		13. Day of Week of Incident M T W Th F Sa Su

A. Extent Of Injury/Illness
(check one)

- ☐ 01 No injury/incident only
- ☐ 02 Injury- No Lost Time/No Medical
- ☐ 03 Medical only
- ☐ 04 Lost Time Only (more than 1 day)
- ☐ 05 Medical and Lost Time
- ☐ 06 Fatality

B. Category (check one)

- ☐ 01 Occupational Injury
- ☐ 02 Occupational Illness/disease

C. Specific Location (check one)

Did this incident occur in or on the grounds of a TNRCC Facility?
☐ YES ☐ NO
If yes, which building and floor? ______
Or, which region? _________

INDOORS:
- ☐ 01 Break room
- ☐ 02 Cafeteria
- ☐ 03 Closet/Storage Area
- ☐ 04 Elevator
- ☐ 05 Exercise Room
- ☐ 06 Hallway/Walkway
- ☐ 07 Hotel Room
- ☐ 08 Laboratory
- ☐ 09 Library
- ☐ 10 Lobby
- ☐ 11 Mechanical Room/Shop
- ☐ 12 Office/Cubicle
- ☐ 13 Parking Garage
- ☐ 14 Restroom
- ☐ 15 Steps, Stairs, Stairwell
- ☐ 16 Training/Meeting Room
- ☐ 17 Other (specify)____________

OUTDOORS:
- ☐ 01 Grounds
- ☐ 02 Highway, Road, Street
- ☐ 03 Lake, River, Stream, or Bank
- ☐ 04 Loading Dock
- ☐ 05 Park, Recreation Area, Boat Dock
- ☐ 06 Parking Lot/Vehicle Compound
- ☐ 07 Roof
- ☐ 08 Sidewalk
- ☐ 09 Steps, Stairs
- ☐ 10 Storage Area
- ☐ 11 Other (specify)____________

D. Activity At Time of Incident
(check one)

- ☐ 01 Carrying
- ☐ 02 Cleaning
- ☐ 03 Climbing
- ☐ 04 Cutting
- ☐ 05 Descending
- ☐ 06 Digging
- ☐ 07 Driving
- ☐ 08 Eating
- ☐ 09 Exercising
- ☐ 10 Grinding
- ☐ 11 Jumping
- ☐ 12 Lifting
- ☐ 13 Loading
- ☐ 14 Mopping
- ☐ 15 Moving
- ☐ 16 Operating
- ☐ 17 Pouring
- ☐ 18 Pulling
- ☐ 19 Pushing
- ☐ 20 Reaching
- ☐ 21 Redirecting
- ☐ 22 Running
- ☐ 23 Securing
- ☐ 24 Sitting
- ☐ 25 Standing
- ☐ 26 Turning
- ☐ 27 Twisting
- ☐ 28 Walking
- ☐ 29 Other (specifiy) ____________

E. Body Part Injured (most serious)

- ☐ 01 Ankle
- ☐ 02 Arm
- ☐ 03 Back
- ☐ 04 Buttocks
- ☐ 05 Cheek
- ☐ 06 Chest
- ☐ 07 Chin
- ☐ 08 Ear (s)
- ☐ 09 Eye (s)
- ☐ 10 Foot/Feet
- ☐ 11 Fingers
- ☐ 12 Groin
- ☐ 13 Hand
- ☐ 14 Head
- ☐ 15 Hips
- ☐ 16 Internal Organ
- ☐ 17 Jaw
- ☐ 18 Knee (s)
- ☐ 19 Leg (s)
- ☐ 20 Mouth
- ☐ 21 Neck
- ☐ 22 Nose
- ☐ 23 Pelvis
- ☐ 24 Rib (s)
- ☐ 25 Scalp
- ☐ 26 Shoulder
- ☐ 27 Toe (s)
- ☐ 28 Wrist (s)
- ☐ 29 Other (specify) ____________

F. Type of Injury (Primary)

- ☐ 01 Abrasion
- ☐ 02 Amputation
- ☐ 03 Bite
- ☐ 04 Bruise
- ☐ 05 Burn
- ☐ 06 Concussion
- ☐ 07 Cut
- ☐ 08 Dermatitis
- ☐ 09 Dislocation
- ☐ 10 Foreign Obj.
- ☐ 11 Fracture
- ☐ 12 Frostbite
- ☐ 13 Hearing Loss
- ☐ 14 Heart Attack
- ☐ 15 Heat Exhaustion
- ☐ 16 Hernia
- ☐ 17 Infection
- ☐ 18 Inflammation
- ☐ 19 Internal Injury
- ☐ 20 Puncture
- ☐ 21 Rupture
- ☐ 22 Scratch
- ☐ 23 Shock
- ☐ 24 Sprain/Strain
- ☐ 25 Sting
- ☐ 26 RepetitiveTrauma
- ☐ 27 Other (specify) ____________

G. Type of Incident (Check One)

- ☐ 01 Aggression (employee, visitor...)
- ☐ 02 Bodily reaction (drug, medication)
- ☐ 03 Caught in, on , under, or between
- ☐ 04 Contact with chemicals
- ☐ 05 Contact with electrical current
- ☐ 06 Contact with temperature extremes
- ☐ 07 Fall on same level
- ☐ 08 Fall on different level
- ☐ 09 Overexertion
- ☐ 10 Overexposure to environmental hazards (noise, heat, sun, cold...)
- ☐ 11 Repetitive Motion
- ☐ 12 Slip (not a fall)
- ☐ 13 Struck against
- ☐ 14 Struck by falling object
- ☐ 15 Other (specify) ____________

H. Physical Thing Most Closely Associated with Incident
(Check one)

- ☐ 01 Aircraft
- ☐ 02 Agency employee
- ☐ 03 Animal, Insect, or Reptile
- ☐ 04 Appliance (coffee pot, toaster, radio)
- ☐ 05 Attachments (belt, pulley, gear.....)
- ☐ 06 Boat or other watercraft
- ☐ 07 Computer/keyboard....
- ☐ 08 Chemical (solid, liquid, gas, fumes)
- ☐ 09 Client or visitor
- ☐ 10 Clothing
- ☐ 11 Container (bottle, barrel, cylinder)
- ☐ 12 Curb, sidewalk, pavement
- ☐ 13 Door
- ☐ 14 Drugs, medicine
- ☐ 15 Electrical device (cord, outlet...)
- ☐ 16 Elevator, escalator
- ☐ 17 Explosives
- ☐ 18 Eyewear
- ☐ 19 Fire, flames, smoke
- ☐ 20 Floor
- ☐ 21 Food products
- ☐ 22 Furniture, fixtures
- ☐ 23 Glass
- ☐ 24 Ground (earth)
- ☐ 25 Hand tool or Power Tool
- ☐ 26 Heating or Cooling Equipment
- ☐ 27 Infectious or parasitic agent
- ☐ 28 Lighting Fixture or equipment
- ☐ 29 Ladder, scaffold
- ☐ 30 Machinery
- ☐ 31 Material Handling Equipment
- ☐ 32 Motor Vehicle
- ☐ 33 Office equipment (copier, Fax,....)

continued on other side

H. Continued......

- ☐ 34 Platform, Dock, Ramp
- ☐ 35 Stair, Step
- ☐ 36 Sun, Heat
- ☐ 37 Trench, Ditch
- ☐ 38 Vegetation
- ☐ 39 Weapon, Firearm, Knife...
- ☐ 40 Other (specify) ______________

I. Action Taken or Planned
(check all that apply)

- ☐ 01 Employee interviewed
- ☐ 02 All employees were made aware of the cause, consequence, and action taken to prevent recurrence
- ☐ 03 Employee given safety training
- ☐ 04 Employee given remedial training
- ☐ 05 Existing procedure or policy enforced
- ☐ 06 Existing procedure or policy revised
- ☐ 07 New procedure or policy developed
- ☐ 08 Physical hazard corrected
- ☐ 09 Other positive action taken ______________

J. Act Associated with Incident
(Check one)

- ☐ 01 Entering unauthorized area
- ☐ 02 Horseplay
- ☐ 03 Fatigue
- ☐ 04 Material handling
- ☐ 05 Mixing or storing of material
- ☐ 06 Lifting
- ☐ 07 Use of Personal Protective Equipment
- ☐ 08 Making safety devices inoperable
- ☐ 09 Not using established route
- ☐ 10 Not using handrail or grab bar
- ☐ 11 Not using lockout device
- ☐ 12 Operating/working at unsafe speed
- ☐ 13 Operating without proper authority/training
- ☐ 14 Over or unnecessary exposure to hazards
- ☐ 15 Repairing/servicing moving object
- ☐ 16 Unobservant
- ☐ 17 Driving
- ☐ 18 Using defective tools/equipment
- ☐ 19 Using wrong tool/material
- ☐ 20 Working without adequate lighting
- ☐ 21 Other (specify) ______________
- ☐ 22 No unsafe act on the part of employee

K. Condition Associated with Incident (Check one)

- ☐ 01 Congested area
- ☐ 02 Defective or unsafe equipment
- ☐ 03 Electrical hazard
- ☐ 04 Excessive noise
- ☐ 05 Harmful animals/insects/reptiles
- ☐ 06 Health hazards (radiation, gas,....)
- ☐ 07 Improperly stored chemicals
- ☐ 08 Improperly stored material
- ☐ 09 Inadequate ventilation
- ☐ 10 Inadequate warning signs
- ☐ 11 Improper layout or design (office, lab...)
- ☐ 12 Inadequate lighting
- ☐ 13 Poisonous vegetation
- ☐ 14 Protruding object
- ☐ 15 Rough/sharp objects
- ☐ 16 Slipping/tripping hazard
- ☐ 17 Unsafe steps, stairs, ladders
- ☐ 18 Unguarded machine, belt, pulley
- ☐ 19 Unguarded hole, trench, or drop-off
- ☐ 20 Unsafe vehicle
- ☐ 21 Unsafe walking surface
- ☐ 22 Other (specify) ______________
- ☐ 23 No unsafe condition

L. Did a policy or procedure apply that would have prevented this incident? ☐ YES ☐ NO

M. Was the policy or procedure followed? If no, explain below ☐ YES ☐ NO ☐ NA

N. **Briefly describe the events that lead to and caused this incident. Explain who, what, where, when, and how. Use additional paper if needed.**

	Supervisor's Signature and Date:

Additional Duty Safety Officer Comment:		
		ADSO Signature and Date:
Division Director Comment:		**Regional Director Signature and Date:**
		Director's Signature and Date:
Safety Manager Comment:		
		Safety Manager's Signature and Date:

This report is completed by the injured employee's supervisor and submitted to Risk Management (MC192) within 3 working days of report of incident.

Form RM-SAF-121 revised 5//98

FROM THE
EXECUTIVE DIRECTOR

TEXAS
WORKERS' COMPENSATION COMMISSION
SOUTHFIELD BUILDING, 4000 SOUTH IH-35, AUSTIN, TEXAS 78704-7491
(512) 448-7900

TWCC ADVISORY 96-03

SUBJECT: EMPLOYEE RIGHTS AND RESPONSIBILITIES FORM

Rule 120.2(e) requires employers to provide injured workers with a summary of their rights and responsibilities at the same time that the Employer's First Report of Injury is filed with the insurance carrier. The Rule provides that the English and Spanish text provided by the Commission must be used without any changes or additional words.

The "Employee Rights And Responsibilities Under The Texas Workers' Compensation System" form published by the Commission (Pub. No. PI96-007A) must be used by employers to comply with the requirements of Rule 120.2(e). This form must be provided in the exact format and text as published by the Commission. The use of published rochures or other information is not a substitute for this form. Failure to use the published form will constitute non-compliance with this Rule.

While the employer may include other information or brochures, this form must be provided to the injured worker. Effective May 1, 1996, the most current version of this form published by the Commission must be used to comply with the provisions of Rule 120.2(e).

Signed this 28th day of March, 1996

Todd K. Brown

Todd K. Brown, Executive Director

Attachment:

Employee Rights And Responsibilities Under the Texas Workers' Compensation System [Pub. No. PI96-007A (3-96)]

Distribution:

Austin Carrier Representatives
TWCC Staff
Public Information List

Employee Rights and Responsibilities under the Texas Workers' Compensation System

nis information describes your rights and responsibilities under the Texas workers' compensation system. For more information or for assistance, please call the Texas Workers' Compensation Commission field office handling your claim, or call 1-800-252-7031.

Your rights under the Texas workers' compensation system

) *You may have the right to receive benefits.*

You may receive benefits regardless of who caused or helped cause your injury. You may not receive benefits if your injury occurred while you were intoxicated, you injured yourself intentionally or while unlawfully attempting to injure someone else, you were injured by another person for personal reasons, you were injured while voluntarily participating in an off-work activity, you were injured by an act of God, or your injury occurred during horseplay.

) *You have the right to receive the medical care reasonable and necessary to treat your work-related injury or illness for the rest of your life.*

) *You have the right to the initial choice of doctor.*

You may not change doctors except with the approval of the mmission. You do not need to get approval to go to a differ- it doctor for emergency treatment, if you or your doctor moves, or if your doctor is unable to continue treating you.

) *You have the right to hire an attorney to help you get benefits or to help you resolve disputes.*

) *You have the right to receive assistance from appropriate, qualified Commission staff and, in the event of a dispute resolution proceeding, from a Commission ombudsman free of charge. To request assistance, contact the field office handling your claim, or call 1-800-252-7031.*

You have the right to receive information and assistance regarding your claim. Commission staff will explain your rights and responsibilities under the Texas Workers' Compensation Act. Additionally, you have the right to be assisted by a Commission ombudsman in informal dispute resolutions and in administrative proceedings if you are not represented. However, an ombudsman cannot serve as a legal representative or attorney for you.

You have the right to confidentiality.

Only people who need to know—such as your doctor, your employer, or your employer's insurance carrier—may see information in the Commission's files. A prospective employer may get 'mited information from the Commission about your claims. If u wish someone who is assisting you to have access to your ile, you must provide written approval for them to do so.

Your responsibilities under the Texas workers' compensation system

❶ *You have the responsibility to tell your employer about your injury or illness.*

You must tell your employer *within 30 days* of the date you were injured, or *within 30 days* of the date you first knew your illness might be work-related. You, or someone helping you, may either talk with or write your employer or any supervisor where you work.

If you do not tell your employer within 30 days, you could lose your right to get benefits.

❷ *You have the responsibility to fill out a claim form and send it to the Commission.*

You must send a completed claim form, called a TWCC-41, to the Commission *within one year* of the date you were injured, or *within one year* of the date you first knew your illness might be work-related. Send the completed claim form to the Commission even if you are already getting benefits.

If you do not send the form within one year, you could lose your right to get benefits. For a copy of the form, call the field office handling your claim, or call 1-800-252-7031.

❸ *You have the responsibility to tell the Commission and the insurance carrier any time your income changes.*

If you are *not* getting benefits and you have changed employers since your injury, tell the Commission if your injury causes you to miss work or lose income. Call 1-800-252-7031.

If you *are* getting benefits and you have changed employers since your injury, tell the Commission and the insurance carrier paying your benefits if your income changes. Tell the Commission and the insurance carrier regardless of whether your income went up or down. If you have stopped working since your injury, tell the Commission and the insurance carrier if you start working again or if you have a job offer.

❹ *You have the responsibility to tell your doctor how you were injured and if you believe it may be work-related.*

If possible, tell the doctor before the doctor treats you.

❺ *You have the responsibility to tell the Commission and the insurance carrier how to contact you.*

You should contact the Commission and the insurance carrier if your home address, work address, or phone number changes, so the Commission and the insurance carrier will be able to contact you when necessary.

nployers: You must provide this information to the injured worker at the same time you report the injury to your insurance carrier. If your insurance carrier has agreed ..te this information to the worker for you, you still have the ultimate responsibility to ensure that the worker receives it. This information must be provided in English ..nish or in English and the language common to the worker. This information may be reproduced or photocopied as necessary but may not be edited or altered in any

AUTHORIZATION FOR RELEASE OF INFORMATION (SORM-16)

Patient:______________________________

TO WHOM IT MAY CONCERN:

You are hereby expressly authorized to release and furnish to the State Office of Risk Management, and/or any associate, assistant, representative, agent, or employee thereof, any and all desired information, (including, but not limited to, office records, medical reports, memos, hospital records, laboratory reports, including results of any and all tests including alcohol and/or drug tests, X-rays, X-ray reports, including copies thereof) pertaining to the physical and/or mental condition which is the basis of my workers' compensation claim. This includes not only all current and/or future information, but also all past medical information which is related to the injury or injuries which form the basis of my claim.

(Print name)______________________________

Photostatic copies of this signed authorization will be considered as valid as the original.

This is not a release of claims for damages.

DATED:__________________________ SIGNED:__________________________

PLEASE SIGN THE ABOVE MEDICAL AUTHORIZATION AND RETURN IT, SO THAT WE MAY SECURE RELEASE OF YOUR MEDICAL RECORDS.

THANK YOU.

STATE OFFICE *of* RISK MANAGEMENT

Form No. SORM-16 9-98

Revised 11/98

CLAIM NUMBER________________
(If Known)

WITNESS STATEMENT
(SORM-74)

MUST BE TYPED OR PRINTED

Claimant ____________________
Employer ____________________
Date of Injury ____________________
Statement Taken By ____________________

Witness Name: ______________________________ Age: __________
Residence Address: ______________________________
Home Telephone: ______________ Work Telephone: ______________
Employer: ______________________________
On ______________, 19___, at about ________ p.m./a.m., I was in or at (clearly state your own location) ______________________________
____
when an accident involving the above employee is alleged to have occurred.

(check only one box)

☐ I saw the accident.
The accident occurred in the following manner: ______________________________
____
____
____
____
____

Other pertinent information and source: ______________________________
____
____

☐ I did not see the accident.
Information given me by (name of person) ______________________________
indicates it occurred as follows: ______________________________
____
____
____
____

Other pertinent information and source: ______________________________
____
____

☐ I know nothing whatsoever about the occurrence.

______________________ Signature

______________ Date

Form No. SORM-74 Rev. 9-98

(PLEASE USE WITH ALL SUBMISSIONS
TO EXPEDITE HANDLING)

EMPLOYEE'S REPORT OF INJURY

Dear Claimant:

We have received a report that you were injured in the course of your employment. In order for us to process your claim efficiently, please fill in all lines completely and print legibly. **Attach additional sheets if necessary.**

1. Name: ______________________________ Social Security: ______________
   LAST FIRST MI MAIDEN
2. Give your current home address: ______________________________
3. By whom are you employed? ______________________________
4. What is your job title/description? ______________________________
5. What are your monthly wages? ______________ 6. How many days per week do you work? ________
7. On what date were you injured? ______________________________
8. What was the exact location of the accident (street address if possible)? ______________________________

   ____
9. How did the accident happen? ______________________________

   ____

   ____
10. What part of your body was injured? ______________________________
11. When did you report this accident? ______________________________
12. To whom did you make your accident report? ______________________________
13. List name(s), address(es), and telephone number(s) of witness or witnesses: ______________________________

    ____
14. Name, address, and telephone number of physician who provided treatment: ______________________________

    ____
15. When did you first receive treatment? ______________________________
16. When did you stop working as a result of your accident? ______________________________
17. Name, address, and telephone number of doctor presently treating you: ______________________________
18. When were you last treated? ______________________________
19. Have you returned to work? __________ If so, when? ______________________________
20. Have you lost any wages on account of your accident? ______________________________
21. Have you ever had a previous injury claim? __________ If so, describe: ______________________________

    ____

(dated) ______________________ (signed) ______________________________

Form No. SORM-29 Rev. 10-98

Explanation of Election Choices
(SORM-80)

Injured employees who lose time from work must elect whether to use their accrued sick leave and all, part, or none of their accrued annual leave for lost time due to their injury. Accrued sick leave and accrued annual leave are the amounts of leave available at the time of injury plus leave earned after the injury. The following details the effects of the different choices available to you:

If You Choose Election 1

★ Injured employees must use all their accrued sick leave and they may also use all, some, or none of their accrued annual leave.

★ All sick leave must be exhausted before annual leave can be used.

You must continue to use sick leave before receiving workers' compensation benefits, even if you have returned to work for a time, but are out again because of your injury. You may wish to consult with your Human Resources department to discuss the impact of this on your leave balances and insurance benefits, should you be off work for an extended period.

★ Workers' compensation benefits do not start until the eighth day of lost time. Employees who cannot work for 28 days will then receive retroactive benefits for that seven-day period or any portion of that seven-day period not covered by leave.

If You Choose Election 2

★ You have chosen to use no sick or annual leave for your compensable injury. This means that you will not receive any payment for the first seven (7) calendar days that you are off work due to your on-the-job injury, unless you are off work for at least 28 days

Form TWCC-1
(Employer's First Report of Injury or Illness)

The **employer** is required to file an **Employer's First Report of Injury or Illness** [Form TWCC-1 (2/91)] with the injured worker's insurance carrier, and the injured claimant or the claimant's representative within 8 days after the employee's absence from work or receipt of notice of occupational disease [Article 8308, Section 5.01(a)].

The **Employer's First Report of Injury or Illness** provides information on the claimant, employer, insurance carrier and medical practitioner necessary to begin the claims process. Details of the claimant's employment and circumstances surrounding the injury or illness are also requested.

Send the specified copies to your **Workers' Compensation Insurance Carrier** and the injured employee. ***Employers - Do not send this form to the Texas Workers' Compensation Commission, unless the Commission specifically requests a direct filing.**

[Article 8308, Sec. 5.05. Employer Report of Injury; Administrative Violation, Texas Workers' Compensation Act; Rule 120.2]

APPENDIX B

Site Safety Briefing Forms

SITE SAFETY BRIEFING

Job Number (Site) ______________________________________ Number TXN000606965
Date ________ Start Time ________ Completed
Site Location
Type of Work (General)
****

SAFETY ISSUES

Tasks (this shift)

Protective Clothing/Equipment

Physical Hazards

Control Methods

Chemical Hazards

Decontamination Procedures/Tasks

Evacuation Procedures/Route/Signals

Evacuation Meeting Area

Nearest Phone

Hospital Name/Address

Special Topics (incidents, actions taken, etc.)

****

ATTENDEES

Print Name Sign Name

Meeting conducted by:

SITE SAFETY BRIEFING

Job Number (Site) ________________________________ Number TXN000606965
Date ________ Start Time ________ Completed
Site Location
Type of Work (General)
****

SAFETY ISSUES

Tasks (this shift)

Protective Clothing/Equipment

Physical Hazards

Control Methods

Chemical Hazards

Decontamination Procedures/Tasks

Evacuation Procedures/Route/Signals

Evacuation Meeting Area

Nearest Phone

Hospital Name/Address

Special Topics (incidents, actions taken, etc.)

****

ATTENDEES

Print Name	Sign Name

Meeting conducted by:

SITE SAFETY BRIEFING

Job Number (Site) ______________________________________ Number TXN000606965

Date ________ Start Time ________ Completed

Site Location

Type of Work (General)

****

SAFETY ISSUES

Tasks (this shift)

Protective Clothing/Equipment

Physical Hazards

Control Methods

Chemical Hazards

Decontamination Procedures/Tasks

Evacuation Procedures/Route/Signals

Evacuation Meeting Area

Nearest Phone

Hospital Name/Address

Special Topics (incidents, actions taken, etc.)

****

ATTENDEES

Print Name	Sign Name

Meeting conducted by:

SITE SAFETY BRIEFING

Job Number (Site) ______________________________ Number TXN000606965
Date ________ Start Time ________ Completed
Site Location
Type of Work (General)
****

SAFETY ISSUES

Tasks (this shift)

Protective Clothing/Equipment

Physical Hazards

Control Methods

Chemical Hazards

Decontamination Procedures/Tasks

Evacuation Procedures/Route/Signals

Evacuation Meeting Area

Nearest Phone

Hospital Name/Address

Special Topics (incidents, actions taken, etc.)

****

ATTENDEES

Print Name	Sign Name

Meeting conducted by:

SITE SAFETY BRIEFING

Number TXN000606965
Completed

Job Number (Site) ______________________________________
Date ________ Start Time ________
Site Location
Type of Work (General)
****

SAFETY ISSUES

Tasks (this shift)

Protective Clothing/Equipment

Physical Hazards

Control Methods

Chemical Hazards

Decontamination Procedures/Tasks

Evacuation Procedures/Route/Signals

Evacuation Meeting Area

Nearest Phone

Hospital Name/Address

Special Topics (incidents, actions taken, etc.)

****

ATTENDEES

Print Name	Sign Name

Meeting conducted by:

APPENDIX C

Health & Safety Checklist

HEALTH AND SAFETY CHECKLIST

_ 1. Conduct safety briefing (each day).

_ 2. Conduct initial site survey (first day).

_ 3. Personal Protective Equipment: Tyvek (or chemical resistant suit) coveralls, boots, inner and outer gloves, respirator and matching organic and particulate filter canisters, hard hat, and goggles.

_ 4. Copy of HASP.

_ 5. First aid and snakebite kits, including ice.

_ 6. Calibrated air monitoring devices.

_ 7. Water (hydration and emergency eye/skin rinse).

_ 8. Emergency contact list and map to hospital (or mark in HASP).

_ 9. Appropriate weather gear (i.e., rain gear, cold weather clothing, etc.)

_ 10. Copy of SSI Work Plan.

_ 11. Cellular phone and all emergency numbers

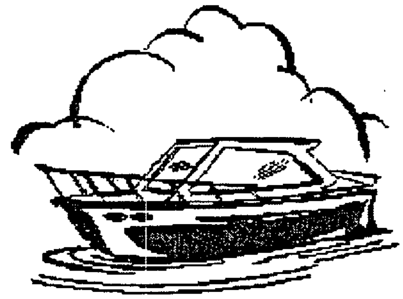
APPENDIX D

Boating Safety Handouts

TEXAS PARKS & WILDLIFE BOATING search

Main Boating Menu

A Digest of the Texas Water Safety Act



THIS DIGEST IS NOT VALID AFTER AUGUST 31, 2003

Information in this digest may change due to Legislative, Commission or USCG action.

TEXAS REGISTRATION AND TITLE

All motorboats and all sailboats 14 feet in length or longer operated on public waters or docked, moored, or stored on public water must be currently registered, properly displaying authorized numbers and validation decal, and titled. All outboard motors must be titled. Title applications and manufacturers statement of origin (MSO) must accompany a request for boat registration for new boats and outboard motors.

Exempted vessels --All canoes, kayaks, punts, rowboats or rubber rafts (regardless of length) when paddled, poled, or oared and sailboats under 14 feet in length when windblown.

TEXAS CERTIFICATE OF NUMBER

When a vessel which is required to be registered is in operation, the certificate of number (registration) must always be aboard and available for inspection by an enforcement officer. The certificate is valid for the two-year period shown on the certificate. When a certificate is renewed the same number shall be reissued, if application to the Department is made within the 90 day period preceding the expiration date.

HOMEMADE BOATS

Requires affidavit of the person as to the origin of the boat, proof of the materials used in the construction of the boat (i.e., bills from marine and hardware dealers for parts, etc.), and requires each homemade boat to be inspected and certified by a Texas Parks and Wildlife (TPW) game warden. Inspection fee - $25.00.

HULL IDENTIFICATION AND MOTOR SERIAL NUMBERS

No person may intentionally or knowingly destroy, remove, alter, cover, or deface the manufacturer's hull identification number. No person may possess a vessel with a hull identification number or an outboard motor with a serial number that has been altered, defaced, mutilated, or removed. A person who has a vessel or an outboard motor with an altered, defaced, mutilated, or removed hull identification number or serial number must file a sworn statement with the Department describing the vessel or outboard motor, providing legal ownership, and stating the reason for the destruction, removal or defacement of the number. **This statement must be accompanied by a fee of $25.00 and an inspection certificate from a game warden stating the vessel or outboard motor has been inspected. This section does not apply to vessels with a valid USCG marine document.**

DISPLAY OF YOUR NUMBER

The number awarded a vessel must be painted on, or otherwise attached to each side of the vessel, near the bow, in such position as to provide easy identification. The number shall read from left to right, be in block characters of good proportion not less than three inches in height and be of a color that contrasts with the background. The numerals must be separated from the prefix and the suffix by hyphens or equivalent spaces such as the following example: **TX 0123 AB** and **TX-0123-AB**. Federal and State law prohibits any other number from being displayed on either side of the bow of your boat. The validation decal must be affixed in a line with and three (3) inches towards the rear the boat from the registration number.

TRANSFER OF OWNERSHIP

When a boat and/or outboard motor is sold, the seller must complete a Form PWD-143, Application For Texas Certificate of Number/title for Boat when selling a boat and a Form PWD-144, Application for Texas Certificate of Title for an Outboard Motor when selling a motor. Application forms may be obtained from TPW offices, Marine Dealers, and some County Tax Assessor/Collector offices. The forms must be completed by both purchaser and seller. If titles have been issued, the title assignments must be properly executed.

The purchaser must: (1) Execute applications, which include a tax affidavit,for registration and titles (boat and motor); (2) Mail applications, assigned titles or bills of sale with required fees and tax to TPW; (3) Applications for transfer of title and ownership must be filed not later than 20 days from date of purchase.

LOST OR DESTROYED CERTIFICATE OF NUMBER

Fill out Form PWD-143, check the space marked "Duplicate," and mail to this Department together with the appropriate fee. It is illegal to operate a motorboat without a certificate of number on board; therefore, care should be exercised not to lose your certificate. No one other than TPW is authorized to produce a Texas Certificate Number.

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SCHEDULE OF FEES

TEXAS CERTIFICATE OF NUMBER
(MOTORBOAT/SAILBOAT REGISTRATION;TX NUMBER)

IF BOAT IS...	THEN FEE IS...
Class A Motorboat (except Livery boat) Less than 16 feet in length	$25.00
Sailboat (Except Livery boat) 14 feet but less than 16 feet in length	25.00
Class 1 Motorboat, Sailboat, or Livery boat 16 feet but less than 26 feet in length	40.00
Class 2 Motorboat, Sailboat, or Livery boat 26 feet but less than 40 feet in length	55.00
Class 3 Motorboat, Sailboat or Livery boat 40 feet in length and over	70.00
Livery boat (less than 16 feet in length)	15.00

IF TRANSACTION IS A...	THEN FEE IS...
Correction	$5.00
Transfer of ownership (Any currently registered vessel)	5.00
Duplicate TX Certificate of NO. (Plastic card)	5.00
State assigned Serial/Hull I.D. No. (PWD Form 504)	5.00
Inspection by TPW game warden	25.00

TEXAS CERTIFICATE OF TITLE FOR A MOTORBOAT OR A SAILBOAT 14 FEET IN LENGTH OR OVER

IF FOR...	THEN FEE IS...
Original title, transfer of title, or duplicate title	$15.00
Correction (Return present titleto TPW)	15.00
"Quick" Title (in addition to above fees)	25.00

OPERATING YOUR BOAT IN ANOTHER STATE

Most other states recognize the validity of your Texas Certificate of Number for the operation of vessel for a period of at least 60 consecutive days.

ABANDONMENT OR DESTRUCTION OF BOAT

You must report such fact within 15, and you must surrender your Certificate of Number with such notice to TPW. Found boats, or boats having no hull identification numers will not be eligible for registration until a physical inspection has been performed by a TPW game warden.

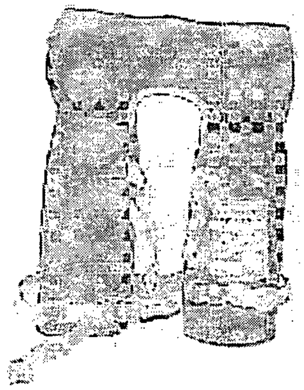
REQUIRED SAFETY EQUIPMENT

OPERATING OF VESSELS WITHOUT REQUIRED EQUIPMENT PROHIBITED

No person may operate or give permission for the operation of a vessel that is not provided with the equipment required safety equipment.

LIFESAVING DEVICES

All Personal Flotation Devices (PFD's) must be U.S. Coast Guard approved, in serviceable condition, readily accessible, and of the appropriate size for intended user.



All children under 13 years of age in motorboats under 26 feet in length must wear a U.S. Coast Guard approved PFD while underway. Underway means not at anchor, made fast to the shore, or aground.

All vessels, including canoes and kayaks, must be equipped with one Type I, II, III or V wearable PFD for each person on board. A Type V PFD is acceptable only if used in accordance with the specific instructions on the label of the device.

Vessels 16 feet and longer, excluding canoes and kayaks, are required to be equipped with one

Type IV throwable PFD in addition to the Type I, II, III, or V PFD required for each person on board.

Inflatable PFDs are authorized only when used in accordance with requirements as presented on U.S. Coast Guard approval labels. Inflatable PFDs are not approved for use on personal watercraft, waterskiing, or other high speed activity.

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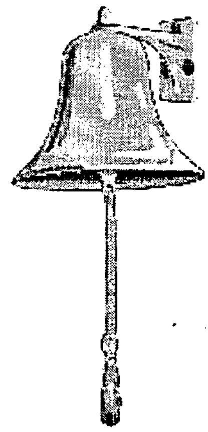
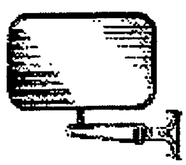


SOUND PRODUCING DEVICES

Any vessel less than 12 meters in length (39.4 ft.) is required to carry a whistle or horn, or some other means to make an efficient sound to signal intentions and position in periods of reduced visibility. Vessels 12 meters or more in length are required to carry a whistle or horn, and a bell.

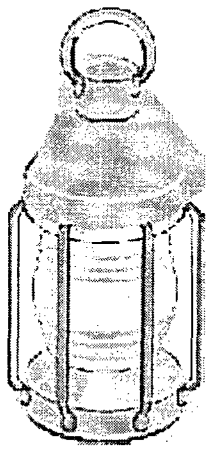


MIRRORS REQUIRED

Every motorboat towing a person or persons on water skis, aquaplane or similar device must have an observer, other than the operator, 13 years of age or older OR be equipped with a rearview mirror of a size no less than four inches (4") in measurement from bottom to top and across from one side to the other. Such mirror shall be mounted firmly so as to give the boat operator a full and complete view beyond the rear of his boat at all times.

LIGHTS REQUIRED

All vessels including motorboats, canoes, kayaks, punts, rowboats, rubber rafts, or other vessels when not at dock must have and exhibit at least one bright light, lantern or flashlight visible all around the



horizon from sunset to sunrise in all weather and during restricted visibility.

Navigation Lights

Power Driven Vessels Underway: Power driven vessels of less than 20 meters (65.6 ft.) but more than 12 meters (39.4 ft.) shall exhibit navigation lights as shown in Figure 1. Vessels of less than 12 meters in length, shall show the lights in either Figure 1 or Figure 2.

Manually Driven Vessels: Manually driven vessels when paddled, poled, oared, or windblown;

- A sailing vessel of less than 20 meters (65.6 ft.), while underway shall exhibit sidelights and a sternlight which may be combined in one lantern carried at or near the top of the mast where it can best be seen.
- A sailing vessel of less than 7 meters (23 ft.) shall, if practicable, exhibit the sidelights and a sternlight, or shall exhibit at least one bright light, lantern or flashlight from sunset to sunrise when not at dock.
- All other manually driven vessels may exhibit sidelights and a sternlight, or shall exhibit at least one bright light, lantern, or flashlight from sunset to sunrise when not at dock.

White lights shall be visible at a distance of at least two (2) miles. Colored lights shall be visible at a distance of at least one (1) mile. "Visible" when applied to lights, means visible on dark nights with clear atmosphere.

Figure 1

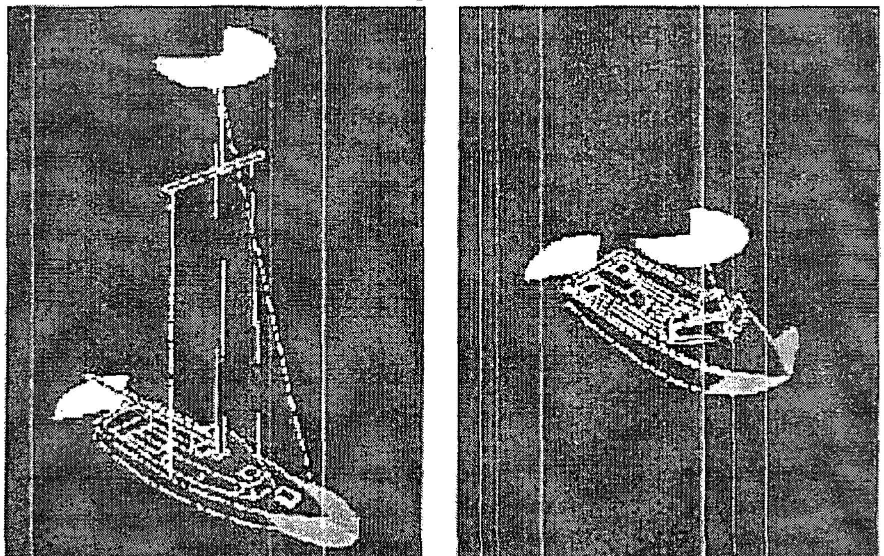
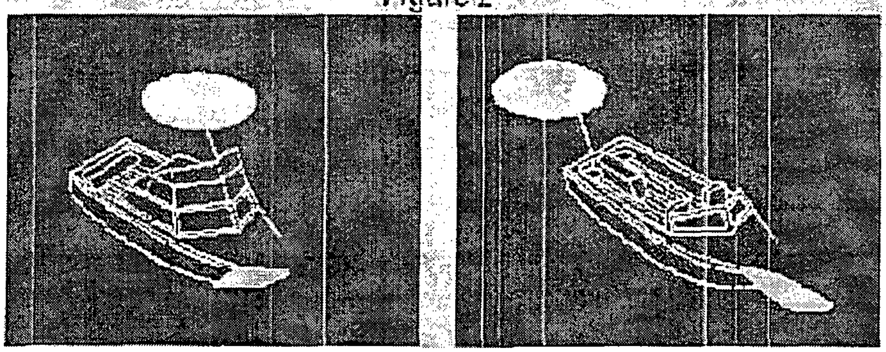


Figure 2



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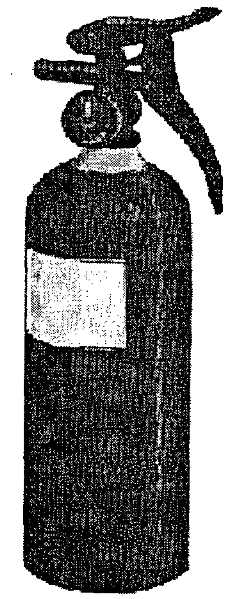
FIRE EXTINGUISHERS REQUIRED

Outboard motorboats less than 26 feet in length, of open construction, not carrying passengers for hire, are not required to carry fire extinguishers; however, a fire extinguisher **is required** if one or more of the following conditions exist: (1) Closed compartment under thwarts and seats wherein portable fuel tanks may be stored. (2) Double bottoms not sealed to the hull or which are not completely filled with flotation material. (3) Closed living spaces. (4) Closed storage compartments in which combustible or flammable materials are stored. (5) Permanently installed fuel tanks. (6) Inboard engines.

U.S. Coast Guard approved extinguishers are identified by the following marking on the label: "Marine Type USCG approved, Size .... Type ::::, 162.028/.../" Check extinguishers annually to assure that they are properly charged.



NOTE: All fire extinguishers must be readily accessible and in condition for immediate and effective use at all times.

Fire extinguishers approved for motorboats are hand-portable, of either B (for gasoline, oil & grease fires) or BC (also extinguishes electircal fires) classification.

Classification (Type-size)	Foam (Minimum gallons)	Dry CO2 (minimum pounds)	Dry Chemical (Minimum pounds)	Halon (minimum pounds)
B-1	11/4	4	2	21/2
B-11	21/2	15	10	10

The number of approved extinguishers required depends upon the class of the motorboat. When the engine compartment of the motorboat is equipped with a fixed (built-in) extinguishing system of an approved type, one less B-1 extinguisher is required.

Vessel length	Without fixed system in machinery space	With fixed system in machinery space
less than 26'	1 B-1	None
26' to less than 40'	2 B-1 or 1 B-11	1 B-1
40' to 65'	3 B-1 or 1 B-11 and 1B-1	2 B-1 or 1 B-11

FLAME ARRESTERS (BACKFIRE FLAME CONTROL) REQUIRED

Gasoline engines installed in a vessel after April 25, 1940, except outboard motors, must be equipped with an acceptable means of backfire flame control. The device must be suitably attached to the air intake with a flame tight connection and is required to be Coast Guard approved or comply with SAE J-1928 or UL 1111 standards and marked accordingly.

EXHAUST WATER MANIFOLD; MUFFLER

A motorboat must have an exhaust water manifold or a factory-type muffler installed on the engine.

BOATING REGULATIONS

INSPECTION OF VESSELS

In order to enforce the provisions of the Water Safety Act, game wardens and other peace officers certified as marine safety enforcement officers by TPW, may stop, board, and inspect any vessel to determine compliance with applicable provisions.

ACCIDENTS AND CASUALTIES

Operators of vessels involved in any collision, accident or other casualty that results in death or injury to any person or property damage exceeding $500 must file a complete report of the accident within 30 days in accordance with Department regulations. Failure to file a report is punishable as a Parks and Wildlife Class C misdemeanor. Accident reports filed by the operator(s) are confidential and are not admissible in court as evidence. Report forms may be obtained from TPW offices, wardens, or marine safety enforcement officers.

STOP AND RENDER AID

The operator of any vessel involved in a boating accident must stop and render whatever assistance is necessary unless such action would endanger his own vessel, crew or passengers. The operator must give his/her name, address and vessel identification number in writing to any injured person and to the owner of any damaged property.

Failure to do so in an accident that results in death or serious bodily injury is punishable as a Parks and Wildlife Felony. Failure to do so in an accident that does not result in death or serious bodily injury is punishable as a Parks and Wildlife Class A misdemeanor.

MANDATORY BOATER EDUCATION REQUIREMENTS

A successfully completed TPW certified boater education course and photo I.D. is required for any person born after September 1, 1984 to operate on the public water of this state a (1) vessel powered by motor of 10 horsepower or more; or (2) a windblown vessel over 14 feet in length. (See #13, Operation of Your Boat.)

EXCEPTIONS: A person is exempt from the mandatory boater education requirement if the person (1) is at least 18 years of age; (2) is accompanied by a person at least 18 years of age who is exempt from the course or who has completed the course; (3) holds a master's, mate's, or operators license issued by the U.S. Coast Guard; or (4) is otherwise exempt by rule of the department.

A person adjudged guilty of one of the following violations: (1) any personal watercraft violation, (2) reckless or negligent operation, (3) excessive speed, (4) reckless operation and excessive speed, (5) hazardous wake or wash, (6) circular course around fisherman or swimmer, (7) interference with markers or ramps, (8) obstructing passage, (9) operating boats in restricted areas, (10) operating vessels in scuba diving or snorkeling areas, (11) skiing during illegal hours or in a manner that endangers life or property, shall be required to successfully complete an approved boater education course and pay a fine. Failure to complete the boater education course within 90 days will result in the person committing an offense that is a Parks and Wildlife Class A misdemeanor.

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OPERATION OF YOUR BOAT

It is UNLAWFUL for any person to:

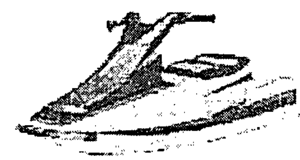
1. Operate at a rate of speed greater than is reasonable and prudent or greater than will permit him to bring such boat to a stop within the assured clear distance ahead.
2. Operate so as to cause a hazardous wake or wash.
3. Operate in a circular course around fishermen or swimmers.
4. Moor or attach to any buoy, beacon, light marker, stake, flag or other aid to safe operation, or to move, remove, displace, tamper with, damage or destroy the same.
5. Anchor in the traveled portion of any river or channel so as to prevent, impede, or interfere with safe passage of any other boat through the same area.
6. Operate within an area designated as bathing, fishing, swimming, or otherwise restricted.
7. Operate within designated "no wake" area except at headway speed without creating a swell or wake.
8. Engage in water skiing, surfboarding or other similar activity between the hours of 1/2 hour after sunset to 1/2 hour before sunrise; provided that this shall not apply to vessels used in recognized water ski tournaments, competitions, exhibitions or trials, provided that the water area is adequately lighted.
9. Operate while intoxicated **(loss of mental or physical faculties, or blood alcohol content of .08 or higher)**. First conviction punishable by a fine not to exceed $2,000, confinement in jail not to exceed 180 days or both; second conviction punishable by a fine not to exceed $4,000, confinement not to exceed one year or both; third conviction punishable by a fine not to exceed $10,000, imprisonment for not more than 10 years or less than 2 years. **Failure to submit a specimen to determine blood alcohol content may result in suspension of your driver's license.**
10. Operate any vessel or manipulate any water skis, aquaplane or similar device, in a willful or wanton disregard of the rights or safety of others and at a speed or in a manner so as to endanger or be likely to endanger any person or property. (Violation of this provision shall be punishable, upon conviction, by a fine of not less than $200 nor more than $2,000 or by

confinement in jail not to exceed 180 days or both.)

11. Swim or dive within two hundred yards of any sight-seeing or excursion boat except for maintenance purposes or unless within an enclosed area.
12. Operate within 50 feet of a "Diver Down Flag" or operate a boat within 150 feet of a "Diver Down Flag" except at Headway/Steerage Speed.
13. Operate any motorboat over 15 hp if under 16 years of age unless accompanied by a person 18 years of age or is at least 13 years of age and has passed a boater education course prescribed by the Department.
14. Fail to comply with the U.S. Coast Guard Inland Rules of the Road.

PERSONAL WATERCRAFT

See Mandatory Boater Education requirements.



Personal watercraft (PWC) is defined as a type of motorboat which is specifically designed to be operated by a person or persons sitting, standing, or kneeling ON the vessel rather than INSIDE the vessel. Includes jet skis, wet bikes, etc. Any person being towed by a PWD is considered an occupant of the PWC.

REQUIRED SAFETY EQUIPMENT FOR PERSONAL WATERCRAFT (PWC)

All equipment requirements for regular motorboats also apply to PWC. In addition to those requirements: (1) each occupant must wear a life jacket; (2) if the PWC is equipped with a cut-off or kill switch, it must be attached to the operator or operator's clothing. Inflatable life jackets are NOT approved for use on PWC.

OPERATION OF YOUR PERSONAL WATERCRAFT

NOTE: Children under 13 are specifically prohibited from operating a PWC unless accompanied on board by a person at least 18 years of age.

All operational rules for regular motorboats also apply to PWC. In addition to those requirements, it is unlawful for any person to: (1) operate a PWC if the operator is under 16 years of age, unless the operator is accompanied by a person at least 18 years of age or the operator is at least 13 years of age and has successfully completed a boating safety course approved by TPW; (2) operate PWC at night (sunset until sunrise); (3) operate PWC within 50 feet of another PWC, motorboat, vessel, platform, person, object, or shore except at headway speed without creating a swell or wake; and (4) operate a PWC and jump the wake of another vessel recklessly or unnecessarily close.

For further information contact your local Game Warden or write:

TEXAS PARKS & WILDLIFE
4200 Smith School Road Austin, Texas 78744

TOLL-FREE TELEPHONE NUMBERS:
1-800-792-1112 - Boater Education
1-800-262-8755 - Boat Registration
1-800-792-1112 - Boat Information

Equal opportunity to participate and benefit from the Texas Parks and Wildlife's recreational boating safety program is available to all individuals regardless of race, color, national origin, sex, age or disability. Discrimination inquiries or complaints should be sent to General Counsel, Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744 or the Office of Civil Rights, U.S. Coast Guard (G-HPE), Washington, D.C. 20593-0001.

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Please send comments, suggestions, or questions to:

TEXAS PARKS & WILDLIFE
4200 SMITH SCHOOL RD. AUSTIN, TX 78744

or click on the address to send an E-mail message.

Home | Hunting | Fishing | Boating | Parks & Historic Sites | Nature | Education | Jobs
Adventure | Conservation | Outdoor Kids | Texas Water
Site Policies | About TPWD | Expo | FAQ | Game Warden | Related Sites
Outdoor Programs | Publications | Search

Last Revision: October 04, 2001

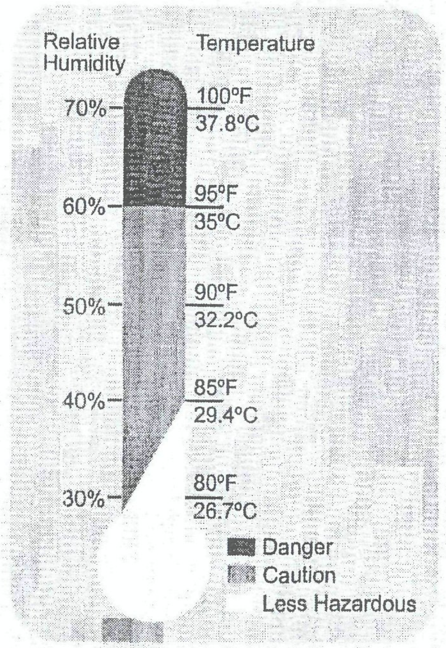
APPENDIX E

Cold and Heat Stress Handouts

The Heat Equation

HIGH TEMPERATURE + HIGH HUMIDITY + PHYSICAL WORK = HEAT ILLNESS

When the body is unable to cool itself through sweating, **serious** heat illnesses may occur. The most severe heat-induced illnesses are heat exhaustion and heat stroke. If left untreated, **heat exhaustion** could progress to **heat stroke** and possible **death**.



U.S. Department of Labor
Occupational Safety and Health Administration
OSHA 3154
2002

Heat Exhaustion

What are the symptoms?

HEADACHES; DIZZINESS OR LIGHTHEADEDNESS; WEAKNESS; MOOD CHANGES SUCH AS IRRITABILITY, CONFUSION, OR THE INABILITY TO THINK STRAIGHT; UPSET STOMACH; VOMITING; DECREASED OR DARK-COLORED URINE; FAINTING OR PASSING OUT; AND PALE, CLAMMY SKIN

What should you do?

- Act immediately. If not treated, heat exhaustion may advance to heat stroke or death.
- Move the victim to a cool, shaded area to rest. Don't leave the person alone. If symptoms include dizziness or lightheadedness, lay the victim on his or her back and raise the legs 6 to 8 inches. If symptoms include nausea or upset stomach, lay the victim on his or her side.
- Loosen and remove any heavy clothing.
- Have the person drink cool water (about a cup every 15 minutes) unless sick to the stomach.
- Cool the person's body by fanning and spraying with a cool mist of water or applying a wet cloth to the person's skin.
- Call 911 for emergency help if the person does not feel better in a few minutes.

Heat Stroke–A Medical Emergency

What are the symptoms?

DRY, PALE SKIN WITH NO SWEATING; HOT, RED SKIN THAT LOOKS SUNBURNED; MOOD CHANGES SUCH AS IRRITABILITY, CONFUSION, OR THE INABILITY TO THINK STRAIGHT; SEIZURES OR FITS; AND UNCONCIOUSNESS WITH NO RESPONSE

What should you do?

- Call 911 for emergency help immediately.
- Move the victim to a cool, shaded area. Don't leave the person alone. Lay the victim on his or her back. Move any nearby objects away from the person if symptoms include seizures or fits. If symptoms include nausea or upset stomach, lay the victim on his or her side.
- Loosen and remove any heavy clothing.
- Have the person drink cool water (about a cup every 15 minutes) if alert enough to drink something, unless sick to the stomach.
- Cool the person's body by fanning and spraying with a cool mist of water or wiping the victim with a wet cloth or covering him or her with a wet sheet.
- Place ice packs under the armpits and groin area.

How can you protect yourself and your coworkers?

- Learn the signs and symptoms of heat-induced illnesses and how to respond.
- Train your workforce about heat-induced illnesses.
- Perform the heaviest work during the coolest part of the day.
- Build up tolerance to the heat and the work activity slowly. This usually takes about 2 weeks.
- Use the buddy system, with people working in pairs.
- Drink plenty of cool water, about a cup every 15 to 20 minutes.
- Wear light, loose-fitting, breathable clothing, such as cotton.
- Take frequent, short breaks in cool, shaded areas to allow the body to cool down.
- Avoid eating large meals before working in hot environments.
- Avoid alcohol or beverages with caffeine. These make the body lose water and increase the risk for heat illnesses.

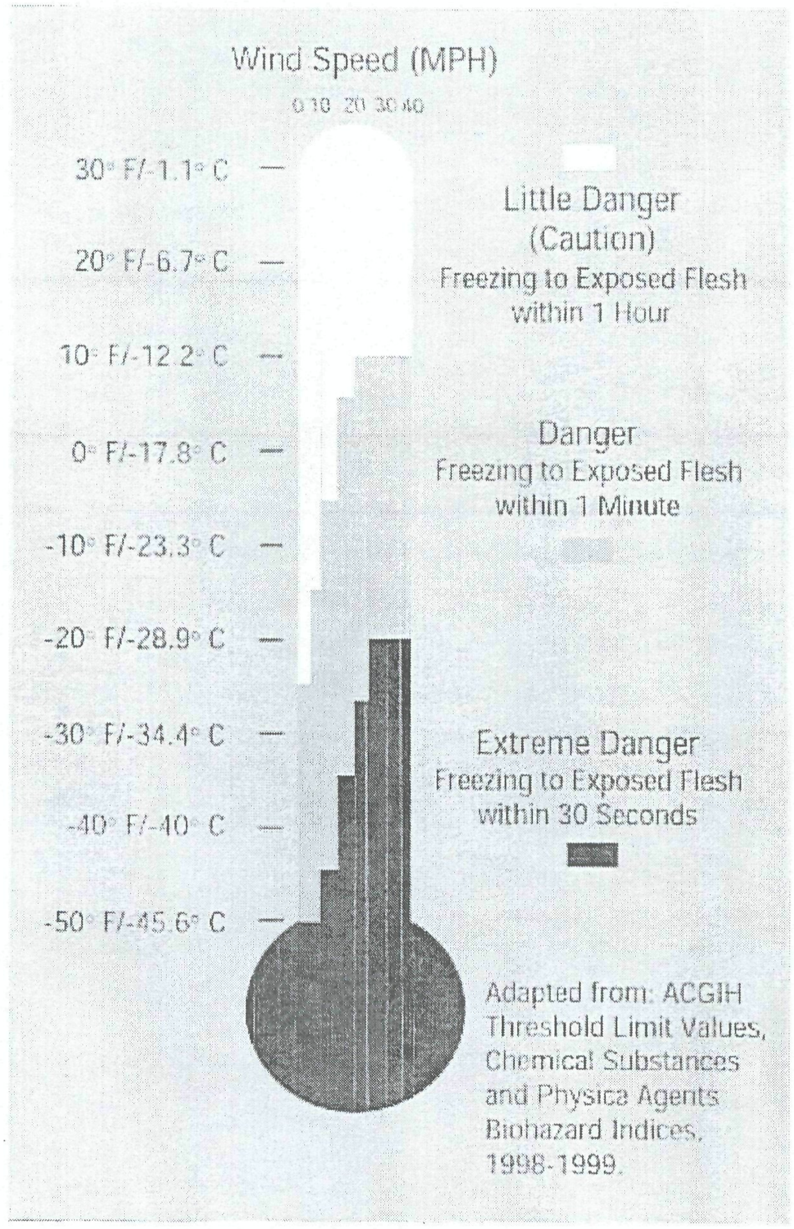
What factors put you at increased risk?

- Taking certain medications. Check with your health-care provider or pharmacist to see if any medicines you are taking affect you when working in hot environments.
- Having a previous heat-induced illness.
- Wearing personal protective equipment such as a respirator or protective suit.

THE COLD STRESS EQUATION

LOW TEMPERATURE + WIND SPEED + WETNESS = INJURIES & ILLNESS

When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result. **Hypothermia** can occur when *land temperatures* are **above** freezing or *water temperatures* are below 98.6°F/ 37°C. Cold-related illnesses can slowly overcome a person who has been chilled by low temperatures, brisk winds, or wet clothing.



U.S. Department of Labor
Occupational Safety and Health Administration

OSHA 3156

FROST BITE

What Happens to the Body:

FREEZING IN DEEP LAYERS OF SKIN AND TISSUE; PALE, WAXY-WHITE SKIN COLOR; SKIN BECOMES HARD and NUMB; USUALLY AFFECTS THE FINGERS, HANDS, TOES, FEET, EARS, and NOSE.

What Should Be Done: (land temperatures)

- Move the person to a warm dry area. Don't leave the person alone.
- Remove any wet or tight clothing that may cut off blood flow to the affected area.
- **DO NOT** rub the affected area, because rubbing causes damage to the skin and tissue.
- **Gently** place the affected area in a warm (105°F) water bath and monitor the water temperature to **slowly** warm the tissue. Don't pour warm water directly on the affected area because it will warm the tissue too fast causing tissue damage. Warming takes about 25-40 minutes.
- After the affected area has been warmed, it may become puffy and blister. The affected area may have a burning feeling or numbness. When normal feeling, movement, and skin color have returned, the affected area should be dried and wrapped to keep it warm. **Note:** If there is a chance the affected area may get cold again, do not warm the skin. If the skin is warmed and then becomes cold again, it will cause severe tissue damage.
- Seek medical attention as soon as possible.

HYPOTHERMIA - (Medical Emergency)

What Happens to the Body:

NORMAL BODY TEMPERATURE (98.6° F/37°C) DROPS TO OR BELOW 95°F (35° C); FATIGUE OR DROWSINESS; UNCONTROLLED SHIVERING; COOL BLUISH SKIN; SLURRED SPEECH; CLUMSY MOVEMENTS; IRRITABLE, IRRATIONAL OR CONFUSED BEHAVIOR.

What Should Be Done: (land temperatures)

- Call for emergency help (i.e., Ambulance or Call 911).
- Move the person to a warm, dry area. Don't leave the person alone. Remove any wet clothing and replace with warm, dry clothing or wrap the person in blankets.
- Have the person drink warm, sweet drinks (sugar water or sports-type drinks) if they are alert. **Avoid drinks with caffeine** (coffee, tea, or hot chocolate) or alcohol.
- Have the person move their arms and legs to create muscle heat. If they are unable to do this, place warm bottles or hot packs in the arm pits, groin, neck, and head areas. **DO NOT** rub the person's body or place them in warm water bath. This may stop their heart.

What Should Be Done: (water temperatures)

- Call for emergency help (Ambulance or Call 911). Body heat is lost up to 25 times faster in water.
- **DO NOT** remove any clothing. Button, buckle, zip, and tighten any collars, cuffs, shoes, and hoods because the layer of trapped water closest to the body provides a layer of insulation that slows the loss of heat. Keep the head out of the water and put on a hat or hood.
- Get out of the water as quickly as possible or climb on anything floating. **DO NOT** attempt to swim unless a floating object or another person can be reached because swimming or other physical activity uses the body's heat and reduces survival time by about 50 percent.
- If getting out of the water is not possible, wait quietly and conserve body heat by folding arms across the chest, keeping thighs together, bending knees, and crossing ankles. If another person is in the water, huddle together with chests held closely.

How to Protect Workers

- Recognize the environmental and workplace conditions that lead to potential cold-induced illnesses and injuries.
- Learn the signs and symptoms of cold-induced illnesses/injuries and what to do to help the worker.
- Train the workforce about cold-induced illnesses and injuries.
- Select proper clothing for cold, wet, and windy conditions. Layer clothing to adjust to changing environmental temperatures. Wear a hat and gloves, in addition to underwear that will keep water away from the skin (polypropylene).
- Take frequent short breaks in warm dry shelters to allow the body to warm up.
- Perform work during the warmest part of the day.
- Avoid exhaustion or fatigue because energy is needed to keep muscles warm.
- Use the buddy system (work in pairs).
- Drink warm, sweet beverages (sugar water, sports-type drinks). Avoid drinks with caffeine (coffee, tea, or hot chocolate) or alcohol.
- Eat warm, high-calorie foods like hot pasta dishes.

Workers Are at Increased Risk When...

- They have predisposing health conditions such as cardiovascular disease, diabetes, and hypertension.
- They take certain medication (check with your doctor, nurse, or pharmacy and ask if any medicines you are taking affect you while working in cold environments).
- They are in poor physical condition, have a poor diet, or are older.

APPENDIX B

The Quality Assurance Project Plan for TCEQ Preliminary Assessment/Site Inspection Program

10-017

TCEQ

Protecting Texas by Reducing and Preventing Pollution

Quality Assurance Project Plan

for

Texas Commission on Environmental Quality

Preliminary Assessment and Site Inspection Program

Federal Grant Identification Number V-96665501-0

Effective Period 2/1/10 – 1/31/11

Document Number 201002.0

QTrak# 10-017

SECTION A PROJECT MANAGEMENT

Quality Assurance Project Plan

Texas Commission on Environmental Quality
Preliminary Assessment and Site Inspection Program

Federal Grant Identification Number V-96665501-0

Effective 02/01/10 through 01/31/11
Document Number 201002.0

Prepared in cooperation with the

U.S. Environmental Protection Agency

October 2009

The preparation of this report was financed through a grant from the U.S. Environmental Protection Agency.

QTrak # 10-017

QUALITY ASSURANCE PROJECT PLAN FOR TCEQ PRELIMINARY ASSESSMENT AND SITE INSPECTION PROGRAM

TCEQ Approval:

Remediation Division

Melissa Cordell
Melissa Cordell
Texas Commission on Environmental Quality
Preliminary Assessment and Site Inspection Program
Program Manager

9/14/09
Date

Randy Arnett
Randy Arnett
Texas Commission on Environmental Quality
Preliminary Assessment and Site Inspection Program
Grant Manager

9/15/09
Date

Robert E. Patton, Jr.
Texas Commission on Environmental Quality
Remediation Division, Superfund Section
Manager

9/16/2009
Date

Lloyd Johnson
Lloyd Johnson
Texas Commission on Environmental Quality
Preliminary Assessment and Site Inspection Program
Quality Assurance Specialist

9/16/09
Date

Pat Fontenot
Patricia Fontenot
Texas Commission on Environmental Quality
Remediation Division
QA/Technical Support/IT and Special Projects Section
Manager

9/16/09
Date

QUALITY ASSURANCE PROJECT PLAN
FOR
TCEQ PRELIMINARY ASSESSMENT AND SITE INSPECTION PROGRAM

TCEQ Approval:

Remediation Division

Brent Wade Texas Commission on Environmental Quality Remediation Division Director	12/4/09 Date

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Field Operations Support Division

Stephen Stubbs
Texas Commission on Environmental Quality
Field Operations Support Division
Quality Assurance Manager

10·6·09.
Date

David W. Bower
David W. Bower, P.G.
Texas Commission on Environmental Quality
Field Operations Support Division
Director

10/7/09
Date

EPA Approval for Implementation:

Bret Kendrick
U.S. Environmental Protection Agency, Region 6
Risk and Site Assessment Section
Site Assessment Manager for Texas

10/19/09
Date

John Meyer
U.S. Environmental Protection Agency, Region 6
Risk and Site Assessment Section
Chief

11/2/09
Date

Walter R. Helmick
U.S. Environmental Protection Agency, Region 6
Superfund Quality Assurance Officer

10/29/08
Date

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(A3) QAPP DISTRIBUTION LIST

Name	Organization
Donald Johnson Quality Assurance Manager	U.S. Environmental Protection Agency, Region 6
Walter R. Helmick Superfund Quality Assurance Officer	U.S. Environmental Protection Agency, Region 6
John Meyer Chief	U. S. Environmental Protection Agency, Region 6 Risk and Site Assessment Section
Bret Kendrick Site Assessment Manager for Texas	U. S. Environmental Protection Agency, Region 6 Risk and Site Assessment Section
Marvelyn Humphrey Team Leader	U. S. Environmental Protection Agency, Region 6 Environmental Services Assistance Team
David W. Bower, P.G. Director	TCEQ, Field Operations Support Division
Stephen Stubbs TCEQ Quality Assurance Manager	TCEQ, Field Operations Support Division Quality Assurance Section
Penny Sterling Quality Assurance Specialist	TCEQ, Field Operations Support Division Quality Assurance Section
Melissa Cordell Program Manager	TCEQ, Remediation Division Preliminary Assessment and Site Inspection Program
Randy Arnett Grant Manager	TCEQ, Remediation Division Preliminary Assessment and Site Inspection Program
Lloyd Johnson Quality Assurance Specialist	TCEQ, Remediation Division Preliminary Assessment and Site Inspection Program
Omar Valdez Health and Safety Officer	TCEQ, Remediation Division Preliminary Assessment and Site Inspection Program
Robert E. Patton, Jr. Manager	TCEQ, Remediation Division Superfund Section

Patricia Fontenot Manager	TCEQ, Remediation Division QA/Technical Support/IT and Special Projects Section
Ken Davis Team Leader	TCEQ, Remediation Division Superfund Section, Team 1
Melissa Cordell Team Leader	TCEQ, Remediation Division Superfund Section, Team 2
Robert Musick Team Leader	TCEQ, Remediation Division Superfund Section, Team 3
Ann Strahl Quality Assurance Specialist	TCEQ, Remediation Division QA/Technical Support/IT and Special Projects Section
Project Managers	TCEQ, Remediation Division Superfund Section
Contract Samplers	

(A4) PROJECT ORGANIZATION

This document, combined with an approved site-specific Work Plan (WP), shall constitute a Sampling and Analysis Plan (SAP) for site inspection (SI) activities conducted by the Texas Commission on Environmental Quality (TCEQ) on behalf of the U.S. Environmental Protection Agency (EPA) Superfund program. This QAPP, the approved site-specific WP, and all pertinent project documents are required reading for the personnel who participate in this project. If no WP is approved for planned site activities, no sample collection, handling, or analysis shall be conducted. This QAPP, together with the approved WP, serves as a controlling mechanism to ensure that data collected are of known and documented quality. This QAPP has been prepared in accordance with the following:

- EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5, March 2001 (Reference 1)
- Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA/G-4, February 2006 (Reference 2)
- Guidance for Quality Assurance Project Plans, EPA QA/G-5, December 2002 (Reference 3)

The PA/SI Process

The Preliminary Assessment and Site Inspection (PA/SI) process begins with the EPA or TCEQ discovery of a site having the potential to release hazardous substances to the environment or by notification to EPA or the TCEQ of possible releases of hazardous substances at a site. Sites entering the process are evaluated using a phased approach consisting of a Pre-CERCLIS Screening step, a Preliminary Assessment (PA) step, and, if necessary, an SI step which include an SI, an expanded SI (ESI), and/or a focused SI (FSI). The Pre-CERCLIS Screening and the PA are limited in scope and are based primarily on available information, e.g., preliminary investigation data, historical operations files, and public resource documents; no samples are collected during these steps. The Pre-CERCLIS Screening and the PA identify sites that may pose a threat to human health and the environment and that may need further action. The sites identified for further action undergo an SI, expanded SI, and/or focused SI, as directed by EPA. During the SI phase, site investigators collect samples to document if hazardous substances are being or have been released from the site and to identify the sites that have a high probability of qualifying for the National Priorities List (NPL).

Data used in the PA/SI program will be of known and documented quality. Data used in the HRS documentation record will be legally defensible and will meet the requirements specified in the HRS Guidance Manual for source contamination data and/or data of releases of hazardous substances (Reference 11).

Figure A.1 illustrates the organization of the PA/SI program and identified lines of responsibility and communication between the key individuals responsible for the project. This organizational structure forms a management team of professionals to oversee the technical aspects of the project supported by an administrative team who will ensure that personnel and equipment are available to the project as required. Table A.1 presents the contact information for the key individuals for the project.

The TCEQ PA/SI Program Manager: Melissa Cordell functions as the TCEQ PA/SI Program Manager. She is responsible for the overall coordination of project activities. She also serves as the primary TCEQ contact for the EPA. As the PA/SI Program Manager, she oversees the PA/SI program's review of WPs, Health and Safety Plans (HASPs), Pre-CERCLIS reports, PA and SI reports, and HRS reports. She is accountable for the successful completion of program-related tasks and objectives. In performing her duties as the TCEQ PA/SI Program Manager, she:

- Maintains a thorough knowledge of program work activities, commitments, deliverables, and time frames;
- Coordinates and provides training for PA/SI PMs;
- Develops necessary lines of communication and good working relationships between the lead division staff personnel from other divisions and organizations participating in the program;
- Monitors the effectiveness of the program quality system;
- Provides feedback to supervisory and administrative personnel as necessary regarding the performance of the grant manager and site investigation managers;
- Advises supervisory personnel when program timetables, task, and coordination procedures are not being met;
- Elevates problems and issues requiring resolution to the lead Division Director, or designee(s), for disposition, when appropriate;
- Coordinates with the EPA Region 6 Environmental Services Assistance Team (ESAT) to set up laboratory space for analysis of environmental field samples and establishes time frames for all field sampling events
- Executes contracts and intergovernmental agreements;
- Prepares, or assists in preparing, contracts and intergovernmental agreements;
- Ensures contractors understand their commitment to meet deadlines and schedule commitments; and
- Implements corrective action measures to ensure contractors meet deadlines and scheduled commitments and, for federally-funded grants, inform the federal project officer and federal funds coordinator of problems and issues relating to corrective actions when necessary.

As the PA/SI Program Manager, she receives the delegated authority from TCEQ's executive management and the TCEQ QA Manager to develop and implement program-related quality systems, including the development and maintenance of this QAPP, with concurrence and assistance from the PA/SI Quality Assurance Specialist.

She is responsible for ensuring the environmental activities within the PA/SI program are performed in accordance with applicable plans and procedures, work performance is measured against specifications, and appropriate management oversight and inspection is accomplished. She is also responsible for improving the program's quality system through:

- Evaluating and controlling deficient items and activities (i.e., preventing inadvertent use or adverse impact on other items and services),
- Determining root cause(s) of deficiencies and nonconformances,
- Planning and implementing corrective actions, and
- Verifying the effective and timely implementation of corrective actions.

The TCEQ PA/SI Grant Manager: Randy Arnett functions as the PA/SI Grant Manager (GM). He also tracks the progress of PA/SI project deliverables. In performing his duties as the TCEQ PA/SI GM, he:

- Maintains a thorough knowledge of work activities, commitments, deliverables, and time frames associated with grants;
- Develops the necessary lines of communication and good working relationships between the lead division staff and personnel of other divisions and organizations participating in a grant;
- Ensures the lead division administrative services coordinator or grant budget coordinator, and the TCEQ federal funds coordinator are informed of changes, revisions, or additions to the project;
- Monitors the effectiveness of the grant quality system;
- Provides feedback to supervisory and administrative personnel as necessary regarding the performance of grant coordinators;
- Advises supervisory personnel when grant timetables, tasks, and coordination procedures are not being met;
- Elevates problems and issues requiring resolution to the lead Division Director, or designee(s), for disposition, when appropriate;
- Monitors the conduct of their grant and reconcile their grant budget with the operating budget and various grant financial reports;
- Prepares, or assists in preparing, contracts and intergovernmental agreements; and
- Implements corrective action measures to ensure contractors meet deadlines and scheduled commitments and, for federally-funded grants, inform the federal project officer and federal funds coordinator of problems and issues relating to corrective actions when necessary.

As the TCEQ PA/SI GM, he receives delegated authority from TCEQ's executive management and the TCEQ QA Manager to develop and implement grant-related quality systems. These systems shall be developed with the concurrence and assistance of the PA/SI QA Specialist.

He is responsible for ensuring that work performance is measured against specifications, and appropriate management oversight and inspection is accomplished. He is also responsible for improving systems relating to specific grants and projects as well as:

- Evaluating and controlling deficient items and activities (i.e., preventing inadvertent use or adverse impact on other items and services),
- Determining root cause(s) of deficiencies and nonconformances,
- Planning and implementing corrective actions, and
- Verifying the effective and timely implementation of corrective actions.

The TCEQ Quality Assurance Specialist (QAS): Lloyd Johnson functions as the QAS for the PA/SI program. In performing his duties, he:

- Participates in the development, approval, implementation, and maintenance of written quality assurance standards (e.g., QMPs, SOPs, QAPPs);
- Assists grant, program, and project managers in developing and implementing quality systems;
- Participates in the preparation of quality reports (e.g., annual reports);
- Prepares and distributes annual assessment plans;
- Determines conformance with program quality system requirements;
- Determines the lead assessor for assessments;
- Recommends to division directors and project managers, and through them to deputy directors, that work be stopped in order to safeguard programmatic objectives, worker safety, public health, or environmental protection;
- Evaluates and concur with proposed corrective actions and the means by which corrective actions will be documented and verified;
- Receives and maintains assessment records;
- Monitors the implementation of corrective actions;
- Identifies positive and adverse trends in program quality systems;
- Reports on the status of corrective action programs;
- Provides technical expertise and/or consultation on quality services;
- Assesses the effectiveness of program quality systems;
- Prepares and forwards an annual quality assurance report to the TCEQ QA Manager;
- Coordinates the identification, disposition, and reporting to management of nonconforming items and activities;
- Reviews contract laboratory program data and non-contract laboratory program data;
- Participates in data quality assessments;
- Coordinates quality training; and
- Serves as a quality system representative on special forums and committees.

He reports to the section manager of the QA/Technical Support/IT and Special Projects Section within the Remediation Division and has access to the Division Director as necessary to identify quality-related problems and to ensure timely and effective corrective action.

He is responsible for updating, distributing, and maintaining this QAPP and securing confirmation of receipt by all personnel identified on the distribution list. He is also responsible for conducting quality assessment reviews, and reviews of all WPs; SI, ESI and FSI reports; and HRS Documentation Records for compliance with this QAPP. The QAS reviews data packages from the EPA Region 6 Laboratory and data memoranda from ESAT and prepares tables of data significantly above background levels for sites. He is responsible for securing, and maintaining on file, a copy of the completed signature page of each WP to document that all WPs are approved and for tracking that information in an electronic database readily available to the project team and management. The QAS audits the field work at 20% of sites within the PA/SI program for a given EPA fiscal year. At a minimum, the QAS conducts one SI, ESI or FSI site during the EPA fiscal year. The QAS provides to the TCEQ GM each month an email report of quality assurance activities completed during the previous month, for inclusion in the monthly report of grant-funded activities to EPA. The QAS functions independently of the PA/SI program and ensures that project quality control and program quality control are maintained.

The TCEQ Project Manager (PM): The TCEQ PM is identified in Section 1 of the approved WP. The TCEQ PM is responsible for the management of the site inspection, including work performed by contractors. The TCEQ PM is accountable for the successful completion of the project tasks and objectives described in the approved WP. The TCEQ PM performs the following tasks:

- Maintains a thorough knowledge of work activities, commitments, deliverables, and time frames associated with projects;
- Provides information to the PA/SI GM for securing laboratory space for analyses of project samples;
- Develops necessary lines of communication and good working relationships between the lead division staff and personnel of other divisions and organizations participating in a project;
- Assists the TCEQ PA/SI Program Manager in coordinating with the EPA Region 6 Environmental Services Assistance Team (ESAT) to set up laboratory space for analysis of environmental field samples and establishes time frames for all field sampling events;
- Ensures the lead division administrative services coordinator or grant budget coordinator, and the TCEQ federal funds coordinator are informed of changes, revisions, or additions to the project;
- Negotiates a list of expectations with the grant manager to ensure a clear understanding of the factors that may affect performance;
- Monitors the effectiveness of the project quality system;
- Elevates problems and issues requiring resolution to the TCEQ PA/SI Program Manager or the TCEQ PA/SI QAS, for disposition, when appropriate;
- Assists in preparing contracts and intergovernmental agreements;
- Ensures project contractors understand their commitment to meet deadlines and schedule commitments; and
- Implements corrective action measures to ensure contractors meet deadlines and scheduled commitments.

The TCEQ PM is responsible for developing the WP that details the sampling strategy for the site. The TCEQ PM prepares the WP for collecting the samples during the SI and obtains approval of the WP from EPA, the PA/SI QAS, and any contractor tasked with activities to be conducted during the SI, ESI, or FSI. The TCEQ PM will also be responsible for making any field sampling determinations as dictated by site conditions. Samples collected during the SI, ESI, or FSI may be analyzed for semivolatiles, volatiles, metals, cyanide, pesticides and polychlorinated biphenyls (PCBs) and, if required, dioxins/furans, perchlorate, radionuclides, and any other hazardous substance.

The TCEQ PM is responsible for ensuring environmental activities conducted during the site inspection are performed in accordance with the approved WP and this QAPP. The TCEQ PM is also responsible for measuring the contractor's work performance against the project specifications and for the management oversight and inspection of work associated with the SI. The TCEQ PM is responsible for improving systems related to the inspection and the program, as well as evaluating and controlling deficient items and activities (i.e., preventing inadvertent use or adverse impact on other items and services), determining root cause(s) of deficiencies and nonconformances, planning and implementing corrective actions, and verifying the effective and timely implementation of corrective actions.

The TCEQ PM shall document in the field notes when the potential exists for the general public to be affected by hazardous substances on the site. The TCEQ PM or Program Manager will notify the regional EPA representative within 24 hours of that determination. If the notification is verbal, the TCEQ PM or Program Manager will follow-up the verbal notification with written notification when the TCEQ PM returns from the site visit. The EPA will determine the course of subsequent action.

The TCEQ PA/SI Health and Safety Officer (HASO): Omar Valdez functions as the TCEQ PA/SI HASO. The TCEQ HASO functions independent of the TCEQ PA/SI PM and is responsible for approving all site-specific Health and Safety Plans (HASPs).

The TCEQ Superfund Section (SS) Manager: Robert E. Patton, Jr. functions as the Manager of the SS. He directs activities performed by the SS staff.

The TCEQ QA/Technical Support/IT and Special Projects Section (TSS) Manager: Patricia Fontenot functions as the Manager of the TSS. She directs activities performed by the TSS staff.

The TCEQ Quality Assurance (QA) Manager: Stephen Stubbs functions as the TCEQ QA Manager. He is in the Field Operations Support Division, and he provides guidance for the TCEQ Quality Assurance Program. He is responsible for the development and maintenance of the agency QMP, the review and approval of program QAPPs with federal funding to ensure that the QAPPs, including this PA/SI QAPP, and stated activities conform to the TCEQ and U.S. EPA requirements. He is also the program manager of the Texas Laboratory Accreditation Program responsible for issuing accreditations to environmental laboratories.

The TCEQ Field Operations Support Division (FOSD) Director: David W. Bower, P.G. functions as the Director of the FOSD. He directs activities performed by the FOSD staff and supervises the TCEQ QA Manager.

The EPA Region 6 Superfund Quality Assurance Officer: Walter Helmick functions as the EPA Region 6 Superfund QA Officer.

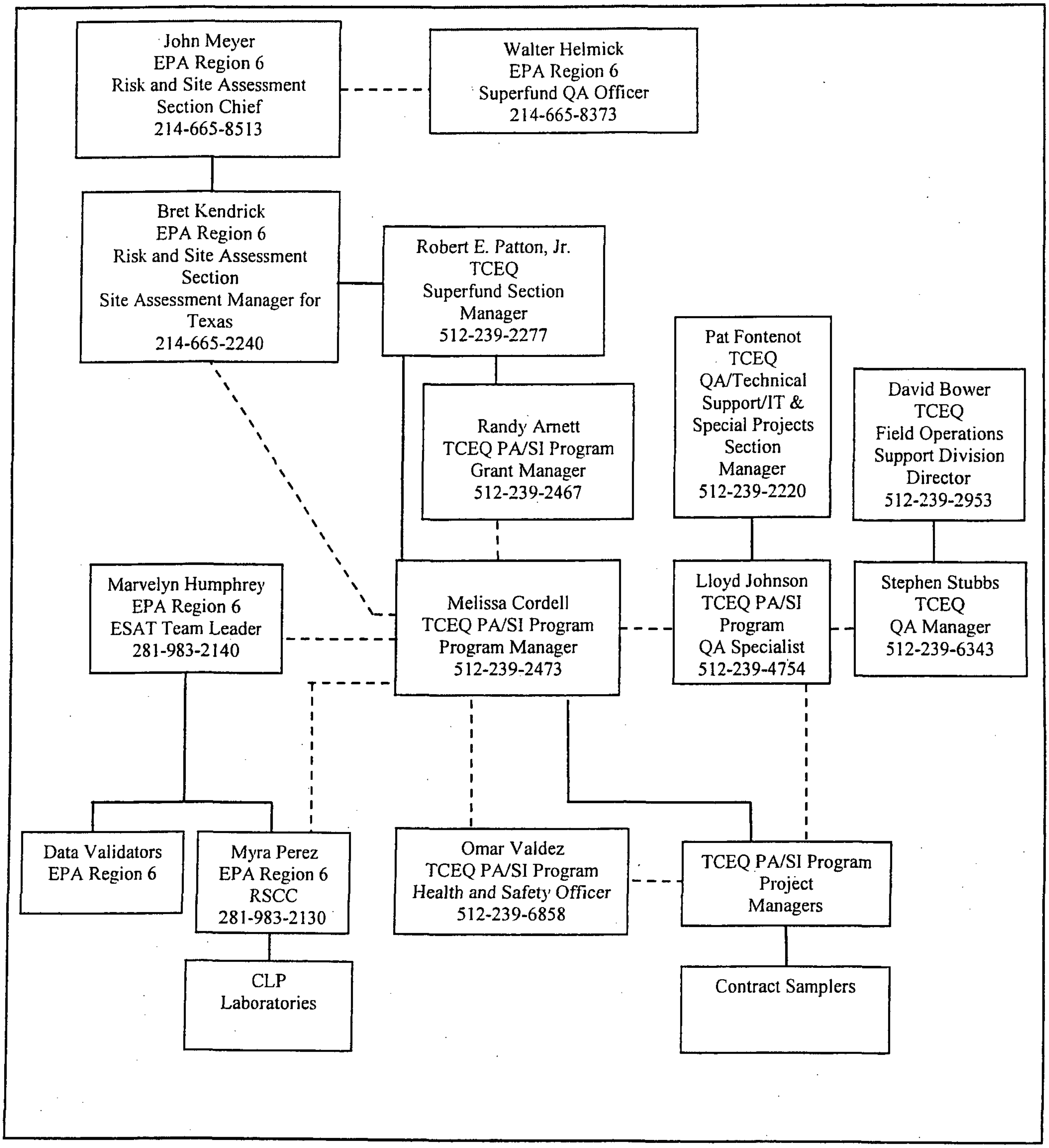
The EPA Region 6 Risk and Site Assessment Section Chief: John Meyer functions as the EPA Region 6 Risk and Site Assessment Section Chief. He directs activities of the Risk and Site Assessment Section and supervises the Region 6 SAM for Texas.

The EPA Region 6 Site Assessment Manager (SAM) for Texas: Bret Kendrick functions as the EPA Region 6 SAM for Texas.

The EPA Region 6 Environmental Services Assistance Team (ESAT) Team Leader: Marvelyn Humphrey functions as the EPA Region 6 ESAT Team Leader.

The EPA Region 6 Regional Sample Control Coordinator (RSCC): Myra Perez functions as the EPA Region 6 RSCC.

Figure A.1 Preliminary Assessment and Site Inspection Program Organization Chart



Line of authority
Line of communication

The TCEQ PA/SI Program Manager, GM and Superfund Section Management will determine which sites are evaluated under the PA/SI Program, in concurrence with the EPA Region 6 Site Assessment Manager for Texas (EPA SAM). The PA/SI Program Manager and GM will then issue site assignments to allow for the majority of Pre-CERCLIS Screenings and PAs to be completed within the first nine (9) months of the EPA grant budget cycle. This scheduling will allow those sites that progress directly to an SI to be completed within the final months of the EPA grant budget cycle. Table A.1 lists the total anticipated time to complete each phase within the PA/SI program. These schedules may be adjusted to meet specific requirements of the EPA. Current guidance for the PA/SI program includes the following references:

- "Hazard Ranking System, Final Rule," *Federal Register* 55:241 (December 14, 1990) p. 51532 (Reference 15);
- USEPA Guidance for Performing Preliminary Assessments Under CERCLA, EPA/540/G-91/013, September 1991 (Reference 12);
- USEPA Guidance for Performing Site Inspections Under CERCLA, EPA540-R-92-021, September 1992 (Reference 13);
- Regional Quality Control Guidance for NPL Candidate Sites, December, 1991 (Reference 17);
- Region 6 CLP Training Manual, August 2001 (Reference 18);
- USEPA Management of Investigation-Derived Wastes During Site Inspections, EPA/540/G-91/009, May 1991 (Reference 19);
- Contract Laboratory Program (CLP) Guidance for Field Samplers, July 2007 (Appendix A);
- USEPA Hazard Ranking System Guidance Manual, EPA 540-R-92-026, November 1992 (Reference 11);
- USEPA Improving Site Assessment: Pre-CERCLIS Screening Assessment, EPA-540-F-98-039, October 1999 (Reference 16);
- Improving Site Assessment: Combined PA/SI Assessments, October 1999 (Reference 20).

The Pre-CERCLIS Screening reports and PA reports approval page will be signed by the TCEQ PM, TCEQ GM, TCEQ PA/SI Program Manager, and the EPA SAM. The information gained from the Pre-CERCLIS Screening and PA, tentative disposition, and other timely information will be incorporated into the WP and used in determining estimated numbers, nature, and location of samples collected during the SI. The WP includes the following:

- Approval page with signature blocks for, and signed by, the
  - TCEQ PA/SI Program Manager,
  - TCEQ QAS,
  - TCEQ PM,
  - EPA Region 6 representative.

- Introductory text which includes the title and the effective period of the QAPP covering the work to be performed under the WP;

- List of project contacts;

- Known or suspected chemicals of concern or hazardous substances;

- Data quality objectives;

- Site background review including site history, descriptions of the site including geology, hydrology, soil conditions, site map(s), and waste handling practices including types and quantities of wastes generated (if known);

- WP summary including field personnel, site reconnaissance checklist, sampling strategy, sampling locations and map(s), and QA/QC sample protocols and decontamination procedures;

- Identification of potential targets for the groundwater, surface water, soil and air exposure pathways;

- Data gaps;

- HASP to describe potential hazards and necessary site specific precautions and preparations for completing the field work described in the sampling plan;

- General project requirements such as a schedule, equipment needed, and mobilization/demobilization procedures;

- Appended written authorization from the EPA SAM delegating to the TCEQ the decision to implement the WP when EPA does not provide final written approval of the WP;

- This QAPP as Appendix 1.

The TCEQ PM will prepare the WP according to the format agreed to by the EPA for use on the PA/SI program grant Scope of Work. Revisions to this format will be determined by the EPA SAM, or EPA designee, and the PA/SI Program Manager prior to preparing the first documents. The EPA will be responsible for final written approval of each WP. However, the decision to proceed with WP implementation may be delegated by written authorization from the EPA SAM to the PA/SI Program Manager, if necessary. The TCEQ PM is responsible for appending that written authorization to the WP if the EPA SAM delegates the implementation of the WP to the TCEQ.

EPA shall choose a laboratory to be used for this project under its Contract Laboratory Program (CLP) or the USEPA Region 6 Laboratory and shall incur all costs for sample analyses. A CLP laboratory or the USEPA Region 6 Laboratory shall provide analytical support for drinking water samples. The sample analyses shall include analysis for all constituents listed on the CLP Routine Analytical Services (RAS) Organic Target Compound List (TCL) and Inorganic Target Analyte List (TAL) unless the WP specifies otherwise. When necessary, the TCEQ PM will request approval to use special analytical service from the EPA SAM.

(A5) PROJECT DEFINITION/BACKGROUND

Abandoned sites that have the potential to release hazardous substances to the environment are discovered by, or reported to, EPA or TCEQ. EPA is responsible for identifying which of these abandoned sites qualify for listing on the NPL. For many of these sites, environmental data are needed to assess the potential, or real, threat a release from the site presents. Data collected for this purpose must be technically defensible when subjected to evidentiary scrutiny. Samples collected during the inspection are used to determine background concentrations of hazardous substances at the site, to identify the hazardous substances present in sources at the site, and to document if hazardous substances are being or have been released from the site.

The major objective of this project is to perform and complete pre-CERCLIS Screenings, PAs and SIs at sites considered potentially hazardous because of current and past operational and waste disposal activities. The Pre-CERCLIS, PA and SI reports will provide technical information and data that can be used to determine the score of each respective site according to the HRS. The HRS is the primary means by which EPA evaluates sites for Superfund's NPL.

Pre-CERCLIS Screenings, PAs and SIs will be conducted in conformance with the requirements of "Hazard Ranking System, Final Rule" *Federal Register* 55:241 (December 14, 1990) p. 51532 (Reference 15). The EPA guidance, listed in Section A4 of this QAPP, for performance of these tasks will be used as reference material in collecting data, planning, and conducting on-site activities, and in preparation of the reports for each site.

(A6) PROJECT/ TASK DESCRIPTION

The TCEQ will complete approximately fifteen (15) Pre-CERCLIS Inspections, seven (7) PAs, seven (7) SIs, one (1) ESI, and two (2) HRS Documentation Records, or equivalent, in Texas in accordance with the PA/SI Grant Statement of Work with the EPA. Field activities will be conducted by a minimum of two (2) persons per Pre-CERCLIS, PA, SI, FSI or ESI site visit. At these sites, one TCEQ staff person will be designated as the lead PM and will have the on-site responsibility for ensuring that the WP and QAPP are followed, and that appropriate data are collected to allow for preparation of site-specific SI/ESI/FSI reports. One TCEQ staff person will be designated as the site HASO. The PM also will be responsible for planning and conducting the site visit and preparing the final Pre-CERCLIS Screening, PA, SI, and ESI report, and the QuickScore score and/or HRS Documentation Record for the site.

TABLE A.1 PROJECT SCHEDULE

I. Pre-CERCLIS Inspections

Pre-CERCLIS Activity Schedule		Technical Work Hours After Site Assignment
Site Assignment to TCEQ		0
Conduct Pre-CERCLIS File Review		50
Conduct Site Reconnaissance		12
Draft Report Complete		28
Final Report Complete		10
	Total Hours:	100

II. Preliminary Assessments

PA Activity Schedule		Technical Work Hours After Site Assignment
Site Assignment to TCEQ		0
Conduct PA Background Research		60
Conduct Site Reconnaissance		12
Draft PA Report Complete		38
Final PA Report Complete		10
	Total Hours:	120

III. Early PRP Search

Early PRP Search Activity Schedule		Technical Work Hours After Site Assignment
State Record Search		10
Title Search		10
Identify Surrounding Property Owners		2
Assemble PRP Search Package		3
	Total Hours:	25

Each PRP Search Package must be submitted to the EPA Cost Recovery Section within ninety (90) days of the PA being assigned to the TCEQ PM.

IV. Site Inspections

SI Activity Schedule[1]	Technical Work Hours After Site Assignment
Site Assignment to TCEQ	0
SI Background Research	60
Prepare SI Work Plan	70
Prepare Health & Safety Plan	20
Execute SI Work Plan (includes acquiring site access)	137
QC Review	40
Draft Quickscore Calculation	12
Draft SI Report Complete	125
Final Quickscore Report	20
Final SI Report Complete	16
Total Hours:	500

V. Expanded Site Inspections

ESI Activity Schedule	Technical Work Hours After Site Assignment
Site Assignment to TCEQ	0
ESI Background Research	160
Prepare ESI Work Plan	70
Prepare Health & Safety Plan	20
Execute ESI Work Plan (includes acquiring site access)	137
QC Review	40
Draft Quickscore Calculation	12
Draft ESI Report Complete	125
Final Quickscore Report	20
Final ESI Report Complete	16
Total Hours:	600

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[1]Scheduling of SI and ESI activities depends heavily on the EPA's turn around time in reviewing and approving such documents as the TCEQ's contract amendment(s), work plans, CLP data packages, and the TCEQ requests for interpretation/ clarification of guidance documents, etc. In the event that schedule delays occur due to the TCEQ awaiting a response from the EPA, the schedule will be amended accordingly, and such amendments will be noted in the Monthly Progress Reports. Refer to PA/SI program SOW for contingencies related to quantity and types of specific projects performed.

VI. HRS Documentation Records

HRS Activity Schedule	Technical Work Hours After Site Assignment
Site Assignment to TCEQ	0
Conduct Background Research	400
Design Draft Scoring Strategy	40
Participate in early Technical Assistance Conference with EPA Region 6/HQ and HRS Review Contractor	20
Draft HRS Report Complete	200
Final HRS Report Complete	40
Total Hours:	700

Initial preparations for each Pre-CERCLIS Screening, PA, SI and ESI site visit will involve obtaining information for preparation of the HASP and SI/ESI WP. This task also includes obtaining access to the site and the site inspection visit. Prior to any on-site inspection, the project staff and the TCEQ Program Manager will review the results of the preliminary assessment and/or available EPA and/or TCEQ files to address any health and safety risk concerns and to assess the level of effort necessary to perform the site visit.

The TCEQ PM or designee will collect and review available file information concerning current and historical activities at the site, e.g., hydrogeologic, photographic and topographic information pertinent to the site (to be used in pathway evaluation), and population and ecological information available for the area surrounding the site (to be used in a target evaluation).

Site activities information to be collected during this study will be primarily the EPA, TCEQ, and other State and Federal agency records for the site. Hydrogeologic and topographic information will be collected at this time primarily from sources such as, USGS topographic maps, city and county maps, county and regional water reports, county and regional geologic cross sections, state well construction records, soil maps, GIS sources. Population and ecological information will be collected primarily from census figures, USGS topographic maps, public school records, the Texas Manufacturers Index, U.S. Fish and Wildlife and Texas Parks and Wildlife endangered species publications, and additional information if available. Aerial photography, as available from the Texas Natural Resources Information System, Texas Department of Transportation, and other sources, may also be examined for additional information about the site.

The level of effort required for the study may be greater for some sites than for others during completion of a PA. This increased effort is necessary because the PAs for some of the sites may have been prepared prior to publication of the current HRS guidance and do not contain complete HRS information. PA activities typically include information gathering and site reconnaissance. SI activities typically include review of data, development of field work plans, field sampling and filling data gaps.

In most cases, the TCEQ will need to obtain access agreements from property owners or property owners' representatives prior to TCEQ performing an on-site inspection. The PM will attempt to obtain access agreements for each site. The designated TCEQ PM for each site will prepare a written notification to the site owner/operator of the scheduled site visit, and followed with a telephone confirmation to onsite persons and/or the property owner. The TCEQ PM will also be responsible for notifying the local TCEQ Regional Office of the impending site visit. The TCEQ GM will provide each member of the TCEQ project staff with written credentials describing the nature of the project and the authority under which it is conducted.

Upon arrival at a site, the inspection team will conduct an initial survey of the site to ensure adequate safety precautions are in place during site activities. The PM will, when possible, conduct a detailed interview with site representatives. Where operator records are present, these will be reviewed for an indication of the type and quantity of materials disposed of at a given site. Where possible, the party responsible for waste disposal will be determined. Interviews with other individuals familiar with the site will be conducted as appropriate before, during, or after on-site reconnaissance activities.

A site-specific HASP will be followed during performance of each Pre-CERCLIS Screening or PA site visit. Site-specific HASPs will be prepared for all SI sites as part of the WP development. All HASPs will be based on TCEQ's health and safety program and TCEQ's understanding of current health and safety regulations.

A thorough site reconnaissance, if possible, will be conducted at each site. The inspection team will visually survey and document the location of the site relative to any roads or other access, drainage systems, surface waters, nearby structures, drums, tanks, monitoring wells, public supply wells, private wells, facility boundaries, unique geological features, and other factors which may affect hazardous substance migration pathways. This information will be recorded in field notes and with photographs. A field site sketch may be prepared during the site visit. If completed, the site sketch will document the location of sensitive environmental receptors such as on-site and off-site residences and public building, natural areas, and drinking water supplies. Indicators of existing problems, such as areas of diseased, dying, or distressed vegetation or discolored soil, also will be noted on the site sketch. Site feature maps showing structures, drainage pathways, and other significant details may be used in lieu of a site sketch provided that they are from documented geographical information system (GIS) sources. Photographs will be taken as necessary to document observations and on-site activities. Generalized population information, including collection of environmental quality data, will be based on the number and types of surrounding homes and businesses.

For each Pre-CERCLIS Screening or PA, initial activities will involve the collection of site background information and completion of a site visit. If a site is designated to proceed to the SI phase, then an SI WP and final SI Report will be prepared for submission to the EPA

For SI sampling events, environmental samples will be collected in accordance with the approved WP to provide site-specific data on the hazardous substances present as well as pollutant dispersal pathways. The samples collected during the SIs typically will be from the following sources (Reference 13):

- on-site and off-site soils and/or sediments;
- groundwater from existing potable and nonpotable water wells, agricultural wells, industrial wells, or monitoring wells;
- water or waste from waste piles, surface impoundments, and/or evaporation pits;
- point of entry into receiving waters in the runoff pathway(s) from the site;
- environmentally sensitive areas near the site.

(A7) QUALITY OBJECTIVES AND CRITERIA

The quality assurance (QA) program described in this QAPP establishes the quality, accountability, and traceability of the work being performed for the TCEQ PA/SI program. Quality assurance encompasses all actions taken by TCEQ and its contractors to achieve results which are accurate, reliable, and legally defensible for all aspects of the project and each entity and individual involved in a PA/SI project is responsible for adhering to the quality assurance specifications outlined in this QAPP. TCEQ and its contractors will follow the standards and procedures specified in the QAPP throughout the duration of the project.

The primary goal of this QA program is to ensure the accuracy and completeness of the data which ultimately will determine the status of the sites that are investigated. In order to achieve this accuracy and completeness, it is necessary that all sampling, analysis, and data management activities be conducted in accordance with preset standards (References 4 -13, 22 and 25). These activities will be reviewed in annual audits to maintain full compliance with the standards. This program has been designed so that corrective action can be implemented quickly if necessary without causing undue expense or delay to the project.

The quality assurance objectives for all measurement data include considerations of precision, accuracy, completeness, representativeness, and comparability. Compliance with the QA objectives will be judged individually for each site. The QC objectives are stated in the EPA CLP Statements of Work (SOWs) (References 4-7, 22 and 25).

CLP analytical services are defined in the SOWs. The following SOWs provide the technical and contractual framework for commercial environmental testing laboratories to apply EPA CLP analytical methods for the preparation/isolation, detection, and quantitative measurement of organic target compounds and inorganic target analytes in water and soil/sediment environmental samples.

Each SOW includes a summary of general requirements; reporting and deliverable requirements; target compound or target analyte list and contract required quantitation/detection limits; specific analytical methods; quality assurance/quality control requirements; chain-of-custody and sample documentation requirements; a glossary of terms; and specifications for reporting data in computer-readable format, when applicable. The following are the most current SOWs:

- USEPA Contract Laboratory Program SOW for Organics Analysis, Multi-Media, Multi-Concentration, OLM04.3, August 2003. This document defines the analytical methods accepted by the CLP for the isolation, detection, and quantitative measurement of 48 volatile, 65 semivolatile, and 28 pesticide/Aroclor target compounds in water and soil/sediment environmental samples (Reference 5).

- USEPA Contract Laboratory Program SOW for Inorganics Analysis, Multi-Media, Multi-Concentration, ILM05.3, March 2004 and ILM05.3 to ILM05.4 Summary of Changes, December 1, 2006. These document defines the analytical methods accepted by the CLP for the preparation, detection, and quantitation of 23 inorganic target analytes and cyanide in water and soil/sediment environmental samples (References 4 and 22).

- USEPA Contract Laboratory Program SOW for Organics Analysis, Low Concentration Water, OLC03.2, June 2001. This document defines the analytical methods accepted by the CLP for the isolation, detection, and quantitative measurement of 50 volatile, 65 semivolatile, and 28 pesticide/Aroclor target compounds in low concentration groundwater and drinking water samples (Reference 6).

- USEPA Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration, SOM01.1, May 2005 with Modifications Updating SOM01.1 to SOM01.2, October 5, 2006 (Reference 7).

- USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration), ISM01.1, July 2008. This document defines the analytical methods for the isolation, detection, and quantitative measurement of 23 metals (including mercury) and cyanide in aqueous/water and soil/sediment samples. (Reference 25).

PRECISION

The precision of a measurement is an expression of mutual agreement between multiple measurement values of the same sample conducted under prescribed similar conditions. Precision is evaluated most directly by recording and comparing multiple measurements of the same parameter on the same exact sample under the same conditions or a matrix spike and matrix spike duplicate. It is usually expressed in terms of the relative percent difference (RPD). The RPD can be evaluated both internally (laboratory duplicates) and externally (field duplicates) by the laboratory. Laboratory duplicate control limits for organics are analyte-, method- and laboratory-specific, and will be evaluated as part of the CLP data validation or USEPA Region 6 Laboratory data review. The precision requirements are stated for each analyte on the Form III of the CLP data package (Appendix G).

For metals analysis, a control limit of 20 percent RPD will be used for matrix spike and matrix spike duplicate sample values greater than or equal to 5 times the contract required detection limit. For field duplicates, a RPD of ±50% will be used as the objective of precision.

ACCURACY

The degree of accuracy of a measurement is based on a comparison of the measured value with the actual true value. Accuracy of an analytical procedure is best determined based on the recoveries of matrix spike, matrix spike duplicate and surrogate compounds.

The degree of accuracy and the recovery of analyte to be expected for the analyses of QC samples and spiked samples are dependent on the matrix, method of analysis, and the compound or element being determined. The concentration of the analyte relative to the method detection limit is also a major factor in determining the accuracy of the measurement. For metals analysis, spike recovery limits of 75-125 percent will be used (Reference 4). The QC acceptance ranges and limits for GC/MS organic analyses used to assess the accuracy of the data according to CLP protocol are stated on the Forms II and III of the CLP data package. These QC acceptance ranges and limits will be used as part of the CLP data validation (Appendix G).

The QC acceptance ranges and limits for all analytical methods used by the USEPA Region 6 Laboratory are stated on the pages marked “Quality Control” in the analytical reports issued by the lab. These QC acceptance ranges and limits will be used as part of the laboratory review performed by the laboratory manager or designee.

The objective for accuracy of field measurements is to achieve and maintain factory specifications for the field equipment. The pH/conductivity/temperature meter is calibrated daily with standard buffer and conductivity solutions. The CGI or PID will be calibrated daily with calibration gas.

REPRESENTATIVENESS

Samples collected should be representative of the population. Because uncontrolled hazardous waste sites vary greatly in size and complexity, specific SI sampling guidelines that apply to all sites are not possible. Site-specific sampling plans are located in the WP developed for each site. The Hazard Ranking System Guidance Manual provides guidance for collecting representative samples (Reference 11). Judgmental samples will be collected, rather than samples collected based on statistical methodology. Samples will be collected at and adjacent to areas of known or suspected contamination, such as retention ponds, container storage, stained soil, or stressed vegetation. These will be compared to background samples collected offsite or upgradient of the areas of known or suspected contamination.

COMPARABILITY

Consistency in the acquisition, handling, and analysis of samples is necessary so the results may be compared with previous and future studies. Concentrations will be reported in a manner consistent with general practices. Standard EPA CLP analytical methods and quality control will be used to support the comparability of analytical results with those obtained in other testing. Standard units are used in the CLP analytical methods as follows:

- Inorganic analytes on the Target Analyte List are reported as µg/l for aqueous samples and as mg/kg for solid samples.
- Organic compounds on the Target Compound List are reported as µg/l for aqueous samples and as µg/kg for solid samples.

Calibrations will be performed in accordance with EPA or manufacturer's specifications and will be checked with the frequency specified in the EPA CLP Statements of Work (References 4-7, 22 and 25).

COMPLETENESS

The completeness of the data is measured as the amount of valid data obtained from the measurement system (field and laboratory) versus the amount of data expected from the system. The EPA-CLP data validation will determine the amount of valid data obtained from each site inspection. At the end of each SI, completeness of data will be assessed and, if any data omissions are apparent, an attempt will be made to re-sample the parameters in question. The specific objective for the completeness of this project will be greater than or equal to 90 percent for field and laboratory data for each site.

ANALYTICAL PARAMETERS AND QUANTITATION LIMITS

The analytical parameters and their quantitation limits for use on this project are determined under the EPA's Contract Laboratories Program (CLP). All samples will be analyzed by CLP methods. The CLP methods specify the Contract Required Quantitation Limit (CRQL), which is the minimum level of detection acceptable for samples analyzed under the CLP (References 4-7, 22 and 25). The CRQLs are listed for each analyte in Table 1 of Appendices B, C and D.

If special analytical services are needed and approved by EPA, the parameters and quantitation limits will be determined at that time. Before analysis, all special analytical parameters and quantitation limits must be approved by EPA.

HOLDING TIMES

Holding times specified by EPA protocols will be set for samples collected under this program. Holding times are specified in Tables 3-2, 3-3 and 3-4 of Appendix A, and in References 4 – 7, 22 and 25.

(A8) SPECIAL TRAINING/CERTIFICATION

All PMs will undergo a formal training program. Major areas covered during the formal training project will be the objectives of the PA and SI, preparation for inspection, legal ramifications, health and safety considerations, use of monitoring and sampling equipment in the field, sample shipment and chain-of-custody procedures, the appropriate procedures to be followed relative to any denial-of-entry problems encountered, and other aspects of the work to be performed under this project.

Each TCEQ employee involved in sample collection will be trained on how to collect representative samples from every medium which might be encountered. Project personnel will receive additional training in proper field documentation and in health and safety procedures. All training will be documented, and records will be maintained by the PM and the TCEQ Training Academy.

(A9) DOCUMENTS AND RECORDS

Following the site visits, the TCEQ will prepare a Pre-CERCLIS Screening and PA report highlighting significant findings for each site.

- The Pre-CERCLIS Screening report will be prepared in accordance with the requirements stated in Reference 16.

- The PA report will be prepared in accordance with the requirements stated in References 11 and 12.

Following the completion of analytical work, the TCEQ will prepare a SI report and HRS Documentation Record highlighting significant findings for each site.

- The SI report will be prepared in accordance with the report outlines approved by EPA Region 6 and appropriate EPA guidance documents, References 11 and 13.

- The HRS Documentation Record will be prepared in accordance with current EPA guidance documents, References 11 and 15.

The references for these reports are listed below:

- USEPA Hazard Ranking System Guidance Manual, EPA-540-R-92-026, November 1992 (Reference 11).
- USEPA Guidance for Performing Preliminary Assessments Under CERCLA, EPA/540/G-91/013, September 1991 (Reference 12).
- USEPA Guidance for Performing Site Investigations Under CERCLA, EPA540-R-92-021, September 1992 (Reference 13).
- "Hazard Ranking System, Final Rule." *Federal Register* 55:241 (December 14, 1990) p. 51532 (Reference 15).
- USEPA Improving Site Assessment: Pre-CERCLIS Screening Assessment, EPA-540-F-98-039, October 1999 (Reference 16).

Should additional guidance become available prior to completion of this project, the TCEQ will evaluate the effect that conformance to this guidance will have on the schedule and budget, and will submit a revised schedule and budget to the EPA for approval.

A Pre-CERCLIS Screening, PA, SI WP, ESI WP, SI report, or Documentation Record will be deemed complete and final when the EPA signature is received, or within six (6) months of submittal with no response received, whichever comes first.

The SI reports will contain a description of the site, the operating history and nature of waste handling at the site, and a discussion of waste sources, pathway characteristics, and identification and description of potential human and environmental targets. In addition, the SI report will contain a description of the data collected, analytical results, and QA/QC data. Supporting documents will be included in the SI report as references and will consist of stratigraphic, hydrogeologic, and topographic information; a site sketch and other pertinent maps; laboratory and chain-of-custody report originals; photographs; field notes; and reports from previous investigations at the site. All data collected during each SI visit will be validated using the most current EPA data validation guidelines and any EPA Regional instructions.

Laboratory reports of CLP data from EPA will include electronic data deliverables in both the long format without validation qualifiers and the short format with validation qualifiers assigned by the ESAT data reviewer.

QUALITY ASSURANCE REPORTS

A summary of all QA activities and findings during the course of this project will be reported on a monthly basis to the PA/SI GM for inclusion in the PA/SI monthly reports to EPA. These QA reports will include information such as the following:

1. Audits of data quality;
2. The status and findings of field audits;
3. The status and findings of management systems reviews;
4. The status and findings of audits conducted by the TCEQ QA Manager or designee, and
5. The status of corrective actions.

QAPP DISTRIBUTION

The PA/SI Program Manager or a designee for the PA/SI program is responsible for distribution of the QAPP to the appropriate personnel listed in the QAPP distribution list, and any TCEQ-contracted personnel responsible for PA/SI activities. The PM is responsible for distributing the WP to project personnel.

RECORD KEEPING

All information pertinent to Pre-CERCLIS, PA site visits and SI sampling activities will be recorded in a logbook. This book will be bound and have consecutively numbered pages. Entries in the logbook will be made in ink and will include, at a minimum, a description of all activities, the names of all individuals involved (sampling and oversight), date and time of sampling, description of photographs taken, weather conditions, any problems, and all field measurements.

Once the Pre-CERCLIS, PA, SI WP, SI report, or Documentation Report is complete, a copy of the report will be placed in PA/SI program files and kept on file for a period deemed necessary. In addition to the copy being placed in PA/SI program files, the final report will be microfilmed and placed in the section of the TCEQ central files which contain PA/SI program files. The raw data and QA/QC data for the project will be kept by the PA/SI program for a period of two years. Anytime after the two year period, data and QA/QC data will be returned to EPA.

SECTION B DATA GENERATION/DATA ACQUISITION

(B1) SAMPLING PROCESS DESIGN

A site-specific SI WP will be prepared by the PM. The PM will meet with the QAS prior to preparing the draft WP to discuss quality assurance issues related to the work to be performed at the site and by the laboratory. The draft WP shall be submitted to the PA/SI QAS for *preliminary concurrence, prior to submission to the* EPA SAM, and *prior to submission to* ESAT for scheduling CLP laboratory services. The WP shall be reviewed and approved in writing by the PA/SI QAS, PA/SI Program Manager, PA/SI GM, and the EPA SAM, prior to the collection of environmental field samples. If necessary, the EPA SAM may provide written approval by e-mail sent to the PM and the Program Manager, to be followed by signing the approval page. Appendix H provides an example of the table in the WP which includes the following information:

- The types and number of samples to be collected.
- The design of the sampling network.
- The sampling locations and frequencies.
- The sample matrices for all sample locations.
- The measurement parameters of interest and chemicals of concern.
- The rationale for the design.

After written approval of the SI WP, the field activities will be executed. At each site, the field activities may include soil sampling, sediment sampling, surface water sampling, and groundwater sampling. No high concentration waste samples will be collected under this QAPP. Samples will be either low or medium concentration.

Detailed reports on all PA and SI non-sampling data collection and SI sampling activities will be kept in field logbooks. In this book will be noted the date, time, location, and identification of each sample, along with the collector's name, a description of all equipment used and any problems encountered, and general comments of the inspection team. Logbooks also are used to record pertinent information regarding the site itself, including date, time, location, and identification of all photographs taken during the site visit.

Proper identification and labeling of samples is crucial to an effective sampling program. Upon collection, each sample must be sealed and tagged. The tag should be marked with a sample identification number, station location, type (composite or grab), preservatives, concentration (low, medium, or high), the parameters requested, collector's signature, the CLP case number, and the date and time of sample collection.

For many of the SIs, the determining factor of hazard evaluation will be the data provided by sampling and analytical activities. Thus, it is important that QA/QC be maintained for each sample. The purpose of this section is to outline specific procedures for Site Investigation Managers to use while acquiring and handling samples during an inspection to ensure that quality data are obtained.

Certified clean sample containers will be used for sample collection. If returned to the office, the bottles will be secured in the TCEQ storage facility to maintain integrity of the sample containers.

(B2) SAMPLING METHODS

This Section discusses the standard sampling procedures. Other sampling procedures may be used as determined necessary by the lead PM and with approval of the PA/SI Program Manager and the PA/SI QAS. If necessary, the professional judgment of the PM may be used to modify sampling procedures during any sampling event, with the approval of the PA/SI Program Manager or the PA/SI QAS.

Field measurements may be collected by use of x-ray fluorescence (XRF) spectrometer, pH/conductivity/temperature meter, water level meter, combustible gas indicator (CGI), and organic vapor analyzer utilizing a photo ionization detector (PID). The objective for precision of field data collection methods is to achieve and maintain the factory specifications for the field equipment. For the pH meter, precision will be tested by multiple readings in the medium concerned. The readings will be within 0.1 pH standard units after the instrument has been field calibrated with standard buffer solutions. The water level indicator readings will be precise within 0.01 foot for duplicate measurements. The CGI or PID will be calibrated each day prior to field use. If calibration readings deviate 15 percent or more from the concentration of the calibration gas, the instrument will be recalibrated.

Regardless of sample type, the following principles and procedures should be adhered to during the sample collection phase of a site inspection:

- Obtain ice before visiting a site where sample collection is involved.
- Use sample container types specified in Tables 3-2, 3-3 and 3-4 on pp. 19-21 of Appendix A.
- Use the sample preservation methods specified in Tables 3-2, 3-3 and 3-4 of Appendix A. At the discretion of the PM, aqueous samples collected for VOA analysis can be preserved without HCl if a 7-day holding time from sample collection to analysis can be met by the laboratory.

- The procedure to check the pH of preserved water samples for metals/cyanide analysis is as follows:
    - Remove the sample container lid.
    - Carefully pour a small amount of sample into the lid. Set the sample container aside.
    - Carefully pour a few drops of sample from the lid over a strip of pH paper with a range of 0-14 pH units in increments of 1 pH unit.
    - Compare the color change of the pH paper to the color scale on the pH paper container.
    - If the pH is not less than 2 for metals or is not greater than 12 for cyanide, add preservative to the sample container, replace and tighten the lid, mix the sample thoroughly, and repeat the pH check procedure.

- If there is reason to suspect the presence of toxic vapors, precede sampling activities by an initial survey of suspect areas, using appropriate safety gear and a photoionization detector (or equivalent). The potential use of air monitoring equipment must be specified in the SI WP.

- If possible, collect background samples first, then proceed from the least likely contaminated to most likely contaminated sampling points. In the case of surface water or sediment samples, sampling will proceed downstream to upstream.

- The sample collector must wear disposable gloves and change them between sampling points, placing used gloves in a plastic bag for disposal.

- If it is necessary to reuse sampling devices, then between sampling points, use the decontamination procedure specified in this section.

- At each sampling location, photograph the sample collection point. Record in the logbook:
    - Sample number;
    - Photo number;
    - Photographer;
    - Direction photographer was facing;
    - Location (show on site sketch);
    - Type of sample;
    - Date and Time;
    - GPS location data, and
    - Relevant observations.

- If a facility representative requests, they will be allowed the opportunity to collect split samples. If these are desired, place samples directly in different containers at the sampling point rather than splitting them at a later time. In the event there may not be enough soil, sediment, and/or groundwater volume to provide split samples, collect the SI required sample first and then provide the remaining volume to the facility representative.

- Before placing samples in the iced cooler for shipment:
  - Complete the sample tags and labels, and place clear tape over the sample labels on the sample containers to protect the writing from moisture.
  - Check the pH of all preserved water samples (exclusive of VOA samples).
  - Place a custody seal around the container cap.
  - Wrap the sample containers with plastic foam, bubble pack, or equivalent to protect against breakage.
  - Place the sample containers in resealable plastic bags to prevent melted ice from contacting the container.
  - Place wrapped sample containers into ice chests filled with 2 to 3 inches of Perlite or other nonflammable sorbent material.

- Include a temperature blank in each ice chest with samples to be shipped for analysis. The temperature blank is a 40mL vial filled with water and labeled "Temp Blank".

- If most of the ice has melted, remove most of the water, and replace with fresh ice. Place ice in resealable plastic bags and double bag ice to minimize water leakage during shipment.

The following standard reporting units will be used during all phases of the project:

- pH will be reported to 0.1 standard units.

- Specific conductance will be reported to two significant figures below 100 umhos per centimeter (umhos/cm) and three significant figures above 100 umhos/cm.

- Temperature will be reported to the nearest 0.5° Celsius (°C).

- Water levels measured in wells will be reported to the nearest 0.01 foot.

- Soil sampling depths will be reported to the nearest 0.5 foot.

MONITORING WELL SAMPLING PROCEDURES

GENERAL

The primary consideration is to obtain a representative sample of the groundwater zone of interest without mixing the sample with stagnant (standing) water in the well casing.

To safeguard against collecting nonrepresentative stagnant water in a sample, the following guidelines and techniques will be adhered to during sample withdrawal:

- As a general rule, all monitoring wells shall be pumped or bailed a minimum of three volumes of water in the well casing with three (3) consecutive consistent readings within 10% RPD for conductivity, ± 1 °C for temperature, and within ± 0.5 pH units before representative samples are withdrawn.

- For wells that can be pumped or bailed to dryness with the sampling equipment, the well should be evacuated and allowed to recover to 85 percent of original water level before sample withdrawal. In the event the well has not recovered to 85 percent after 24 hours, a sample may be drawn from the well. Enter the well volume recovered into the field logbook.

- The purge waters will be managed according to guidance provided in the "Management of Investigation-Derived Wastes During Site Inspections", May 1991, EPA/540/G-9/009, Sections 4.5 - 4.6, pp. 25 – 27 (Reference 19). The preference is to leave both RCRA hazardous and non-hazardous investigation-derived wastes on-site whenever it complies with regulations and does not pose any immediate threat to human health and the environment. All purge water containers must be labeled as investigation-derived waste.

SAMPLING, MONITORING, AND EVACUATION EQUIPMENT

Sample containers will conform to EPA regulations for the appropriate constituents.

The following equipment should be on hand when sampling wells:

- Coolers for sample shipping and cooling, chemical preservatives, and appropriate packing materials.

- Camera and film, labels, appropriate keys (for locked wells), tape measure, water level indicators, and pH/temperature/specific-conductivity meter.

- Pumps will normally be used to obtain samples, although samples may be obtained directly from the pump discharge line for high yielding monitoring wells and wells with dedicated pumps.

- Bailers and monofilament line with tripod-pulley assembly (if necessary).

- Decontamination solutions--tap water, distilled water, Alconox, isopropanol, 10% nitric acid solution, and CLP specified grade water. Note: isopropanol exposed to heat and air converts to acetone over time.

Ideally, sample withdrawal equipment should be completely inert, economical to manufacture, easily cleaned, and reused, able to operate at remote sites in the absence of power resources, and capable of delivery variable rates for well purging and sample collection.

CALCULATION OF WELL VOLUME

Calculations are to be made according to the following steps:

- Obtain all available information on well construction (casing, screens, etc.).
- Determine well or casing diameter.
- Determine static water level (feet below top of casing).
- Determine depth of well from top of casing.
- Calculate number of linear feet of static water (total depth minus the static water level).
- Calculate one well volume in gallons: V = H cf, where H is height of static water column, and cf represents the conversion factors for common size monitoring wells. For 2" well, cf = 0.1632 gallons/foot and for a 4" well, cf = 0.6528 gallons/foot.
- Determine the well volumes in gallons to be evacuated before sampling.

If possible, a number of observations will be made when groundwater sampling is to take place. Some of the information can be gained from file review prior to a site inspection.

- Note if monitoring wells are locked. Arrangements must be made to secure keys or to remove locks by other means and re-secure the wells.
- Note the condition of the monitoring wells (i.e. casing, concrete pad, etc.).
- Note well diameters to ensure that a pump and/or bailer of the proper size will be available. The diameter is also necessary for calculating the wells' static water volume.
- Note the type of casing materials--PVC, steel, etc.
- Note any observable physical characteristics of the groundwater as it is being sampled--color, odor, turbidity, etc.
- Measure the static water level of each well before sampling, if possible. This is best accomplished with an electronic water level indicator. Similarly, determine the total depth of the well before sampling. Obtain these measurements whether or not well logs are available, since the measurements are required in calculating the static water volume of the well.
- Measure the pH, temperature, and specific conductivity of the groundwater being sampled. To avoid possible contamination problems, measure temperature, pH, and specific conductivity on a portion of groundwater which is not in a sample container to be

sent out for analysis.

PUBLIC AND PRIVATE WATER WELL SAMPLING PROCEDURES

Public and private drinking water wells will be purged in accordance with the Remediation Division Standard Operating Procedure (SOP) 7.9, *Purging a Drinking Water Well.* If the PM determines the drinking water well is used daily, the SOP can be modified to allow the water to flow for 5 minutes prior to collecting the first measurement of purge water temperature, pH and conductivity.

Samples will be collected in accordance with the Remediation Division SOP 7.10, *Sampling a Drinking Water Well.*

Agricultural and industrial wells will be sampled in the same way.

SURFACE WATER SAMPLING PROCEDURES

Surface water sampling locations will be selected according to the probability that they will show contaminants migrating from a site. In general, samples will be collected from streams running through or adjacent to a site, including those bodies of water which may receive surface runoff or leachate from a site. Samples will only be collected where it can be shown that the site provides the only source of contaminants to the surface water body. Care will be taken in sampling leachate breakouts, which may have high concentrations of contaminants. Surface water will also be sampled from any adjacent standing bodies of water such as ponds, lakes, or swamps which might be receiving contaminants.

Grab samples will be collected by partially immersing the sample container, allowing water to flow slowly into the container while preventing sediment, vegetation or debris from entering the container. Gloves will be worn to protect personnel from contaminants. Sample containers for VOA samples must be completely filled, to avoid headspace.

SURFACE SOIL SAMPLING PROCEDURES

Areas selected for sampling will be judgmentally determined by the PM based on knowledge of the site conditions and site history. A surface inspection of the subject area will be made to locate pertinent features (e.g., rock outcrops, drainage patterns, surface runoff, erosion areas, etc.) and to evaluate the relationship among these features and potential sources of pollution. The locations of sediment deposition areas are good indicators of surface runoff direction.

A method of obtaining a shallow soil sample is to use stainless steel spoon or shovel. A decontaminated shovel, spade or trowel will be used to remove surface vegetation and roots in the topsoil so the sample can be collected free of plant materials. Stones will be removed with decontaminated tools. Shallow soil samples are typically collected in the 0-6" depth interval. When deemed appropriate, a deeper soil sample may be obtained through the use of a soil corer. The depth interval of the collected soil sample will be recorded in the field logbook. After collection, the soil sample will then be placed in the appropriate container. After the sample has been collected, the top of the container and lid will be wiped with a clean paper towel to ensure a tight seal. Samples for VOA analysis will be collected first, followed by samples for BNA's, metals and pesticides/PCBs. Appendix B of Appendix A includes the procedure for collecting soil samples utilizing Encore sampling methods. Care will be taken to fill the VOA sample container as full as possible to eliminate headspace. If metals are the primary concern at a site, the metals sample will be collected second.

Dedicated sampling equipment will normally be used. If dedicated equipment is not used, then an equipment rinsate sample shall be collected upon completion of the decontamination procedure. To avoid cross contamination, sampling equipment such as stainless steel scoops and spoons, and shovels or spades must be decontaminated between sampling locations, according to the procedure specified on page 41.

SEDIMENT SAMPLING PROCEDURES

Areas selected for sampling will be judgmentally determined by the PM based on knowledge of the site conditions and site history. The primary consideration in sample site selection will be to choose an area of quiescent settling with low hydrologic activity or energy, and to evaluate these areas and potential sources of pollution. Quiescent areas are conducive to the settling of finer materials, e.g. inside the bend of channels; backwater areas or side channels; and areas of heavy shoaling and deposition.

Sediment samples will be collected by use of a sediment corer, stainless steel bowl and spoon, or an Ekman dredge. The preferred sediment sample collection method is the sediment corer. The stainless steel bowl and spoon, or an Ekman dredge may be used when use of the sediment corer is not practical. The same sediment sampling method will be used to collect all samples during each individual sampling event. When using a dredge, it will be lowered to the bottom of the water body with a minimum of substrate disturbance. Once the dredge jaws have been triggered, the closed dredge will be retrieved at a moderate speed of less than two (2) feet/second. Water overlying the sediment in the dredge will be gently decanted by slightly tipping the dredge until the water runs out the top. The decanting process will be completed in a manner to avoid the removal of surficial sediments. In order to avoid contamination from material on the dredge walls, a stainless steel spoon will be used to remove sediments to a depth of one inch and no closer than 1 inch to the wall of the dredge. The sediment sample will then be placed in the appropriate sample container. Pebbles and sticks will not be transferred to the sample container. Additional dredge samples will be collected as needed to fill the sample container. After the sample has been collected, the top of the container and lid will be wiped with a clean paper towel to ensure a tight seal. Samples for VOA analysis will be collected first, followed by samples for BNA's, pesticides/PCBs, metals and cyanide.

If metals are the primary concern at a site, the metals sample will be collected second. Care will be taken to fill the VOA sample jar as full as possible to eliminate headspace. The Ekman dredge and stainless steel spoons must be decontaminated according to the specified procedures between sampling locations to avoid cross contamination. Dedicated sampling equipment will normally be used.

DECONTAMINATION PROCEDURES

To prevent contamination of samples by materials originating from the variety of on-site sampling tools and equipment, all sampling equipment (sample spoons, bowls, bailers, surface water dippers) will be decontaminated. Dedicated sampling equipment will be available for each sample planned. All equipment to be used at one site will be decontaminated in one batch prior to initiating any sampling. Each sampling tool will be placed in an individual sealable plastic bag or wrapped in a large plastic trash bag and closed with a custody seal. In the event that additional sampling is required or a sampling tool's integrity is questionable, then that tool will go through a decontamination process.

The sampling equipment will be cleaned using the steps in the sequence below before it is used for collecting a sample. After sampling is complete, each sample tool will be cleaned with a detergent wash and rinsed with potable water to remove any visible contamination.

1. Rinse equipment with tap (potable) water.
2. Clean the equipment with a brush in a solution of laboratory-grade detergent (Liquinox, Alconox, or equivalent) and potable water.
3. Rinse with tap water.
4. Rinse with 10 percent nitric acid solution, (trace metals grade) if analyzing for metals.
5. Rinse with distilled or deionized water.
6. If analyzing for organics, rinse with reagent-grade isopropanol.
7. Rinse with deionized water.
8. Air dry.
9. Place in a resealable plastic bag and seal the bag with a completed custody seal if immediate use is not expected.

(B3) SAMPLE HANDLING/CUSTODY REQUIREMENTS

Sample custody is an integral part of any sample collection and analysis plan. Several steps for maintaining sample custody apply to field sample custody versus laboratory sample custody. First, in the field, the appropriate collection, identification, preservation, and shipment of the samples will ensure sample integrity. The second step is correct sample bottle identification and preparation. Lastly, when samples reach the laboratory, they are assigned a laboratory number and maintained at 4 °C until sample preparation and analyses can be performed.

FIELD SAMPLE CUSTODY

Sample custody and documentation procedures described in this section will be followed throughout all sample collection for all TCEQ SIs. Components of sample custody are field logbooks, sample labels, sample tags, and chain-of-custody forms. The new standard for sample custody and documentation for Region 6 requires the use of the Field Operation and Records Management Systems, FORMS II Lite program. The FORMS II Lite program automates many of the manual procedures associated with documenting sample collection activities, including the completion of sample tags, sample labels, and chain-of-custody records. The products of the FORMS II Lite program will serve as chain-of-custody forms for the PA/SI program. However, if the FORMS II Lite is inoperative during a sampling event, CLP traffic reports will be utilized. Examples of sample tags, sample labels, and chain-of-custody records are contained in Appendix A, pages 24-30.

If any non-CLP special analysis is to be utilized, the sample labels, sample tags, and chain of custody forms must be approved by EPA.

FIELD LOGBOOKS

Bound field logbooks will be maintained by the TCEQ PM and other team members to provide a daily record of significant events, observations, and measurements during the field investigation. Each page in the logbook will be initialed by the author and signed after the last entry of each day. All entries by persons other than the author will be initialed or signed. All entries will be signed and dated.

All information pertinent to the field survey and sampling will be recorded in the logbooks. The logbooks will be bound books with consecutively numbered pages that are at least 4 ½ inches by 7 inches in size. Waterproof ink will be used in making all entries. Personnel recording information in the field logbook will sign and date the top and/or bottom of each page. Pages that are partially used will be marked through the empty portion and signed and dated. Pages intentionally left blank will be marked through entirely and signed and dated. Only the right side (odd numbered pages) of the logbook will be used. The left side (even numbered pages) will not be used to record information, and will be marked through entirely and signed and dated.

Entries in the logbook will include, at the minimum, the following:

- General information:
  - Names of personnel;
  - Date and time of arrival at the site;
  - Location of sampling activity;
  - Physical, environmental, and weather conditions during field activity.
- Sampling documentation:
  - Sample medium (e.g., soil);
  - Observations such as sample color, odor, consistency, etc.;
  - Description of sampling point(s);
  - Date and time of collection;
  - Sample identification number(s).
- Photographs:
  - Name of the photographer;
  - Date and time of the photograph;
  - The direction the photograph was taken;
  - The number of the photograph on the film roll. If a digital camera is used, number the photographs in sequence for the event.
- Global Positioning System (GPS) data:
  - Name of the person collecting the GPS data;
  - Date and time of the data collection;
  - GPS file number;
  - Identification number of the GPS equipment (optional),
  - Latitude/longitude coordinates collected (optional).
- Other information:
  - Names of any site visitors or interviewees;
  - Field observations and unusual field conditions;
  - Any field measurements made (such as pH, conductivity, temperature) including specific calibration data and documentation of field equipment (decontamination, etc.);
  - Modifications to the WP or QAPP;
  - Sample handling (e.g., preservation with ice).

None of the field logbooks, field logbook pages or chain-of-custody documents will be destroyed or discarded, even if they are illegible or contain inaccuracies that require a replacement document. If a previously recorded value is discovered to be incorrect, the wrong information will be crossed out in such manner that it is still legible, the correct value written in, and the change initialed and dated. If the change is made by someone other than the original author or if the change is made on a subsequent day, a reason for the change will be recorded at the then-current active location in the logbook, with cross-references.

SAMPLE TAGS

All samples collected at the site will be placed in an appropriate sample container for preservation and shipment to the designated laboratory. Each sample will be identified with a separate identification label and tag. The bottles and ice chests will be sealed with custody seals. Sample identification tags and custody seals will be provided by the CLP Sample Management Office (SMO). The tag will indicate if the sample is a split sample. The label will contain the sample number. The following information will be recorded on the tag:

- Analyses to be performed;
- Sample identification number;
- Source/location of sample;
- Type of sample (composite or grab);
- Preservatives used (e.g. ice, HNO_3, NaOH);
- Date;
- Time (a four-digit number indicating the 24-hr clock time of collection; for example, 1430 for 2:30 PM);
- Sampler's signature;
- CLP case number.

Once the tag is complete, a custody seal will be placed over or around the lid of the bottle. The custody seal will show the date and sampler's signature.

INSTRUCTIONS FOR COMPETING TRAFFIC REPORT FORMS

INTRODUCTION - SAMPLES AND SAMPLE NUMBERS

The CLP organic and inorganic multi-sample Traffic Reports/Chain-of-Custody forms (TRs) generated from FORMS II Lite will be utilized to ship samples to CLP or other designated laboratories. They also enable the SMO and the Region to track samples and ensure that the samples are shipped to the appropriate contract laboratory for the appropriate analysis.

The TR includes a chain-of-custody record which is located at the bottom of the form. The COC must be signed in blue ink. The form is used as physical evidence of sample custody. According to EPA enforcement requirements, official custody of samples must be maintained and documented from the time of collection until the time the samples are introduced as evidence in the event of litigation. The lead PM is responsible for the care and custody of the sample until sample shipment.

A sample is considered to be in custody if any of the following criteria are met:

- The sample is in possession of the sampling team or is in view after being collected.
- The sample was in possession and then locked up or sealed to prevent tampering.
- The sample is in a secured area, and security is documented.

CLP sample types are defined by the RAS analytical program. Under the RAS Protocol (SOW), a RAS sample consists of a low or medium concentration water matrix or a soil/sediment matrix that is single phase and homogeneous. Neither oily sample, nor multi-phase sample can be shipped to a CLP laboratory operating under the RAS contract. If analysis is required of high concentration samples, oily matrix samples, or multi-phase samples, contact Christy Warren of the EPA Region 6 lab at 281/983-2137. The collection and management of high concentration samples will be conducted in accordance with the requirements indicated in Section 3.2.2.2 of Contract Laboratory Program (CLP) Guidance for Field Samplers, July 2007 (Appendix A), and Contract Laboratory Program Organic and Inorganic Modified Analyses (Appendix F).

Low concentration samples are samples typically collected from off-site areas, where hazards are thought to be significantly reduced by normal environmental processes. Medium concentration samples are those where a compound or element may comprise as much as 15% of the total sample.

Low/medium inorganic samples may be analyzed for total metals, cyanide, or both. Low/medium organic samples may be analyzed for VOAs, base/neutral/acid extractables (BNAs), pesticide/PCBs, or any combination of these. High concentration organic samples may be analyzed for VOAs, BNA, and pesticide/PCBs. Inorganic samples are documented on Inorganic TRs. Organic and high concentration samples are documented on Organic TRs.

A CLP sample is one matrix, either water or soil, and never both. The CLP sample is further defined as consisting of all the sample aliquots from one station location, for each matrix and RAS analytical program.

The CLP generates unique sample numbers that must be assigned to each organic and inorganic sample. The unique CLP sample numbers are distributed by email to the TCEQ PM or QAS as requested. The field team leader will be responsible for assigning these critical sample numbers correctly and entering the numbers accurately into the F2L program.,

Organic sample numbers are in the format FX123, and Inorganic sample numbers are in the format MFX123. These labels are created by the FORMS II Lite Program and printed in the office or the field. Remember that the unique sample number must only be used once.

Use only the sample numbers provided by EPA Region 6. Sample numbers beginning with "F" designate samples for organic analyses. Sample numbers beginning with "MF" designate samples for inorganic analyses.

Remember:

- TRs must be used for each case number with every shipment of samples to each CLP laboratory.
- Organic samples, high concentration samples, and inorganic samples are assigned separate, unique sample numbers. Each sample consists of all the sample aliquots from a sample station location for analysis in one of the three analytical programs.
- A CLP RAS sample will be analyzed as either a water or a soil sample.
- Use a **blue ink** pen to sign the Traffic Reports generated by FORMS II Lite.
- The Regional Copy of the FORMs II Lite TR must be sent to:
  Myra Perez
  USEPA
  10625 Fallstone Road
  Houston, Texas 77099
- The laboratory copies of FORM II Lite TR must be placed in a resealable plastic bag and taped to the inside of the cooler lid. Samples in this cooler must correspond to those listed on the TR.
- All copies of a TR page (i.e., page 2 of 2) must be signed by the sampler and the "Relinquished by" must be signed by the appropriate designee.
- Use the sample numbers specific to EPA Region 6.
- Contact the Program Manager at telephone number 512/239-2473 if you need to collect more than the previously approved number of samples or a high concentration sample.
- Call Regional Sample Control Center (RSCC) at telephone number 281/983-2130 or the FORMS II Lite help desk at (703) 715-4474 if you have any questions.

- Call the SMO daily at 703/818-4383 to report shipping information (check lab assignment).

COMPLETING THE FORMS II LITE CHAIN OF CUSTODY FORMS

The Organic and Inorganic Traffic Report/Chain of Custody forms in the FORMS II Lite program are produced by utilizing the program. The Forms II Lite Wizard provides for step-by-step preparation of chain of custody forms, sample labels, and sample tags.

STEP 1 - SITE INFORMATION

The top section of the screen contains a list of sites that have been previously created. The bottom section contains data entry fields for the site at which sampling is to be conducted.

- The red fields, "Site Name" and "Project Leader", are required fields. The "EPA Region Number" field is also required. Enter the EPA Region number, which is Region 6.
- The fields "Account Code", "DAS Number", "OP Unit", "Spill ID", and "Regional Project Code" are not currently used by the PA/SI Program.
- Enter the 5-digit case number in the "Case Number" field. The case number is obtained from the CLP RAS Lab Assignment Information.
- Enter the EPA site ID number in the "CERCLIS" field. The EPA site ID number is an alphanumeric designation, of the form TXN 123456789.
- Enter the type of field activity to be performed in the "Action" field.
- Enter the agency which is performing the field activity in the "Lead" field. This will typically be State/Tribe.
- Enter the TCEQ as the contractor in the "Sampling Company" field.

STEP 2 - SELECT SAMPLING TEAM

- Add names of new team members by utilizing the "Add/Edit Team Members" button.
- Add or remove names of team members by clicking on a name, then utilizing the arrow buttons.

STEP 3 - SELECT ANALYSIS

- Add analysis methods by clicking on an analysis method, then utilizing the arrow buttons.

- Add special analysis methods by clicking on the "Add/Edit Analysis" button. In the "Add/Edit New Analysis" window, the "Program", "Analysis", and "Analysis Abbreviation" fields are required.

STEP 4 - STATION/LOCATION INFORMATION

- The "Station Name" field is not currently used by the PA/SI Program. To disable the field, click on the "Close" button. Then click on "Customize" on the toolbar, and select "Preferences". Click on the "Step 4" tab in the "User Preference" window, select "Use Station Location", and close the window. Then click on "File" on the toolbar, select "Open Site", and click on the site name. Use the "Next" button to return to Step 4.

- Enter the sample numbers in the "Station Location" field.

- After entering the sample numbers, the "Matrix" field becomes a red, required field. Enter the sample matrix.

- Enter the date and time of sample collection in the "Sample Date/Time" field, after the sample has been collected.

- Enter the name of the person who collected the sample in the "Sampling Team Member" field, after the sample has been collected.

STEP 5 - ASSIGN BOTTLES

- Click on the first sample in the "Select Station/Location" field. Then click on the appropriate analysis method in the "Select Analysis" field.

- Enter the number of bottles to be filled with sample in the "Number of Bottles" field.
-
- Enter the tag prefix number in the "Tag Prefix" field. The tag prefix number for the PA/SI Program is 6, which is the EPA Region number.

- Enter the six-digit tag number from the appropriate tag provided by EPA in the "Starting Tag #" field. Click the box adjacent to "Auto Increment Tag #" so that a check mark appears in the box.

- Click the box adjacent to "Use CLP Sample Numbers" so that a check mark appears in the box. Enter the alphanumeric CLP sample number provided by EPA in the "Next Available CLP #" field. Then click the "Assign" button.

- Enter the appropriate sample preservation in the "Preservative" box in the "Assigned Analysis with Sample number" field.

- Then click on each subsequent sample in the "Select Station/Location" field, and perform each step. The CLP number will automatically increment for each sample.

- Assign lab QC samples by clicking on an appropriate sample in the "Select Station/Location" field, and then enter the lab QC sample type in the "Lab QC Type" box in the "Assigned Analysis with Sample number" field.

STEP 6 - ASSIGN LAB

- Click on each sample in the "Select Samples to Assign" field, select the appropriate lab in the "Lab Code" box, then click the "Assign" button.

STEP 7 - ASSIGN CARRIER

- After the samples have been collected, click on each sample in the "Select Samples to Assign" field, and select the appropriate shipping company in the "Carrier" box.

- Enter the shipping date for the sample in the "Date Shipped" box.

- After the sample has been placed in a cooler for shipping, enter the tracking number of the cooler's air bill in the "AirBill Number" field, then click the "Assign" button.

SHIPPING OF SAMPLES

Samples will be shipped and delivered to the designated laboratory for analysis daily. Sampling personnel will make an effort to ship samples the same day they were collected, whenever possible. During sampling and sample shipment, the TCEQ PM (or designee) will contact the SMO (designated on the CLP RAS Laboratory Assignment information facsimile) to inform them of shipments. **TCEQ PERSONNEL WILL NOT CONTACT THE RECEIVING LABORATORY UNDER ANY CIRCUMSTANCES!**

The samples will be shipped in ice chests by an overnight carrier such as Federal Express. The laboratory TRs will be placed within the ice chest, which will be sealed with custody seals and tamper-resistant tape. Custody seals will be signed by the sample custodian shipping the samples. The air bill number will be noted on the TR. **In addition to the air bill and TR form(s), each ice chest will contain a return air bill to provide for return of the ice chest to *Project Manager's Name*, MC-136, TCEQ, Building D, 12100 Park 35 Circle, Austin, Texas 78753.**

(B4) ANALYTICAL PROCEDURES

The CLP methods of analysis will be used for most analytical work conducted for the PA/SI program. The CLP analytical procedures are specified in the SOWs listed as References 4-7, 22 and 25 and briefly described in Appendices A-F. When the request for laboratory space is made during the planning process, the request will explicitly state that the laboratory will use CLP methods of analysis.

The CLP methods are specific to the CLP, and the State of Texas does not offer accreditation for these methods at this time. For any needed analyses by a non-CLP method, the TCEQ will request EPA to use a laboratory NELAC-accredited by the Texas Laboratory Accreditation Program and will provide a list of NELAC-accredited laboratories to EPA for consideration.

The CLP laboratory is required to provide the data deliverables and meet the reporting requirements specified in the SOWs. The extraction methods, analytical methods, and required equipment are listed in References 4-7, 22 and 25 and Appendices B-E as follows:

- Table 2 and p. 3 of Appendix B and Exhibit D of Reference 5.
- Table 2 and p. 2 of Appendix C and Exhibit D of Reference 4.
- Table 2 and pp. 1-2 of Appendix D and Exhibit D of Reference 6.
- Table 2 and p. 4 of Appendix E and Exhibit D of Reference 7.
- Exhibit D of Reference 25.

(B5) QUALITY CONTROL REQUIREMENTS

Quality control (QC) for field work on this project will involve analysis of blank samples, spiked samples, and duplicate samples. These field QC samples are described below and in Table 3-1 of Appendix A. Additionally, the PM will include in each ice chest with samples to be shipped for analysis a temperature blank inside the ice chest prior to shipping. The temperature blank is a 40mL vial filled with water and labeled 'Temp Blank'.

The required control limits for CLP laboratory work for each QC activity, corrective action required when the control limits are exceeded, and how the effectiveness of the corrective action shall be determined and documented, are stated in the National Functional Guidelines for data review (References 8-10 and 21).

The required control limits for EPA Region 6 laboratory work for each QC activity, corrective action required when the control limits are exceeded, and how the effectiveness of the corrective action shall be determined and documented, are stated in "USEPA Methods for the Determination of Metals in Environmental Samples Supplement 1" (EPA/600/R-94/111) (Reference 23) and "USEPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition with updates I through VIB, February 2007 (revised) (Reference 24).

FIELD QUALITY CONTROL SAMPLES

The field QC samples include matrix spike/matrix spike duplicates (MS/MSD), field blanks, equipment rinsate blanks, and field duplicates. All samples will be collected with dedicated equipment, if possible. All sampling equipment will be decontaminated prior to initiating sampling activities.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLES

The MS/MSD will be generated by the CLP laboratory through the addition of standard solutions to a previously selected field sample. The field sample to be spiked should be collected at a location known or suspected to be contaminated with the site-specific chemicals of concern. Extra sample volume for a MS/MSD will be collected by the field team, as specified by the CLP Regional Sample Coordinator (Myra Perez), and sent to the assigned CLP laboratory. Samples designated as MS/MSD must be included with the first shipment of samples to each laboratory. The frequency of collection of MS/MSD is 1 for every 20 field samples of the total number of samples collected during the sampling event for each sample matrix. For example, if 25 soil samples are collected, 2 MS/MSD samples are required.

FIELD BLANKS

Field blanks are blanks that are collected at the same time and location as field samples at a location where airborne contaminants might contaminate the field sample during collection. The field blank consists of ASTM Type II water, poured into a VOA sample vial at the sampling site. Field blanks should be collected downwind of potential sources of contamination. Analysis of field blanks will typically be for VOAs, but may be for any chemicals of concern. Frequency of collection of field blanks is one for each sample matrix per day, with a minimum of one field blank per day. Field blanks are collected as follows:

- Complete the sample labels and attach them securely to the 40ml VOA sample vials.
- Select a sample location where a field sample has been collected, and which is near or downwind from potential sources of airborne contaminants.
- Open one sample vial, and fill with ASTM Type II water until a meniscus forms. While filling, tilt the vial slightly towards the stream of water and pour slowly so that no bubbles are formed.
- If collecting the field blank for VOA analysis, close the vial tightly. If collecting the field blank for other analytes, preserve the sample according to the method prescribed in the WP, then close the vial tightly.

- If collecting the field blank for VOA analysis, invert the vial, tap gently, and inspect for air bubbles in the vial. If air bubbles are present, discard the sample and collect another.

- Fill the remaining sample vials in the same way.

- Securely attach the sample tags.

- Preserve the samples according to the method prescribed in the WP.

EQUIPMENT RINSATE SAMPLES

Equipment rinsate blanks will consist of CLP-specified grade water that has been poured over the equipment after completion of decontamination. The number of blanks collected in the field will be specified in the WP for each site. The blanks collected in the field will not be counted for the laboratory's quality control protocol for matrix spikes or duplicate samples. Equipment rinsate samples will be collected to establish that proper decontamination of field sampling equipment and handling techniques have been employed. Dedicated sample equipment will be used at each site for each sample station. After sample collection, all dedicated sampling equipment (stainless steel spoons, bowls, sediment coring tips, Ekman dredge, etc.) will be cleaned so as to remove dirt, debris, and other gross contamination. A comprehensive decontamination of all sampling equipment, during which a rinsate sample will be collected, will be performed by TCEQ. The equipment rinsate sample will be prepared by collecting ASTM Type II water from the final rinse of the sampling equipment. The rinsate sample will be shipped to the assigned CLP laboratory for analysis. Finally, the sample equipment will be placed in individual dated plastic bags, including chain-of-custody seals.

If sample equipment must be used more than once in the field, then the decontamination procedures for sample equipment will be followed. A rinsate sample will be collected in the field, after the initial decon event and at the end of each sampling day and/or between each sample matrix type sampled, whichever is greater. The rinsate sample will be shipped to the assigned CLP laboratory with the associated sample matrix type. The number and type of QA samples at each site will be estimated in the WP. Modifications to the plan may be deemed necessary by the PM depending on field conditions, the on-site determination of additions or removals of sample locations, and the number of days required to complete the site sampling investigation.

FIELD DUPLICATES

For samples collected for laboratory analysis, field duplicates will be collected at a rate of 1 per 10 samples per day of the total number of samples collected during each day of sampling for each sample matrix type at every site. The number of samples collected will be rounded up to the next increment of ten, such that twenty-one samples would require collection of three duplicates, if collected within three days. At least one field duplicate will be collected per day of sampling for each sample matrix. The field duplicate sample will be packaged and sent to the laboratory for analysis with the other samples of the same sample matrix type.

(B6) INSTRUMENT/EQUIPMENT TESTING, INSPECTION, MAINTENANCE

Equipment and instruments requiring preventive maintenance will be serviced in accordance with the manufacturer's specified recommendations and written procedures developed by the manufacturers. The equipment and instruments are those used by the CLP laboratories to analyze samples collected under the CLP program, and by the field sampling team during purging of wells for the collection of groundwater samples. Testing, inspection, and maintenance of equipment, instruments, and other items used in the analysis of samples will be performed by CLP laboratory personnel pursuant to Exhibit E in References 4-7, 22 and 25. Procedures to be followed for field instruments used for project purposes are discussed in Section B7 of this QAPP. References 4-7, 22 and 25 are available at http://www.epa.gov/superfund/programs/clp/index.htm under the "Analytical Methods" heading. Click on the link to a test method (ILM05.3, OLM04.3, OLC03.2, ISM01.1 or SOM01.2) and then scroll down and click on the "Exhibit E" link.

SCHEDULES

Manufacturer's procedures identify the schedule for servicing critical items in order to minimize the downtime of the measurement system. It will be the responsibility of the operator to adhere to this maintenance schedule and to arrange any necessary and prompt service as required. Service to the equipment, instruments, tools and gauges shall be performed by CLP laboratory personnel pursuant to Exhibit E in References 4-7, 22 and 25.

The equipment manager for the PA/SI program will maintain all sampling equipment as required.

RECORDS

The laboratory will record maintenance and service procedures and schedules. All maintenance records will be documented and traceable to the specific equipment, instruments, tools, and gauges. Records produced will be reviewed, maintained, and filed by the operator when equipment, instruments, tools, and gauges are used at the sites. The logs and records will be maintained and managed pursuant to Exhibit E in References 4-7, 22 and 25.

(B7) CALIBRATION PROCEDURES AND FREQUENCY

Calibration of field instruments and equipment will be performed at approved intervals as specified by the manufacturer or more frequently as conditions dictate. Calibrations also may be performed at the start and completion of each test run. However, such calibrations will be re-initiated after any delays. Calibration will be performed at least twice, once before use and once after use. Standards will be used and duplicate samples analyzed in the field to verify pH and specific conductance data. Standards will be provided by the equipment manager.

Instruments and equipment used to gather, generate, or measure environmental data will be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of results are consistent with the EPA CLP specifications. Calibration of laboratory equipment will be based on approved written procedures. It is the responsibility of the CLP laboratory personnel to ensure that the proper calibration protocols specified in the CLP SOW were used. These calibration procedures and frequencies are included in Exhibit E of References 4-7, 22 and 25.

Records of calibration, repair, or replacement will be filed and maintained by the designated laboratory personnel performing quality control activities in accordance with EPA CLP requirements. Calibration records of assigned laboratories will be filed and maintained at the laboratory location where the work is performed and will be subject to QA audit. The records will be maintained and managed pursuant to Exhibit E in References 4-7, 22 and 25.

(B8) INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES

All the consumable supplies, (e.g. sample bottles, deionized water, ice coolers, nitrile and latex gloves, plastic sheeting, zero-contamination tubes) will be inspected on a regular basis and before a sampling event. Acceptance criteria for field supplies will vary for each consumable. At a minimum, expiration dates, physical integrity, and cleanliness will be checked during inspection. The PA/SI program equipment coordinators will order the necessary supplies for project completion and conduct the inspections. The PM for the project is also responsible for inspection of the necessary supplies and equipment for project completion.

After project completion, all unused supplies and consumables will be returned to the storage unit in good condition (e.g., good physical integrity, clean, open packages resealed with a custody seal) and placed in the designated area. All dedicated sampling equipment requiring decontamination will be placed in a designated area. In addition, the project manager must provide written communication to the PA/SI Program Manager the following information:

- Damaged equipment;
- Problems with any piece of equipment;
- Need for additional supplies.

(B9) NON-DIRECT MEASUREMENTS

Data for project implementation or decision making that are obtained from non-measurement sources such as computer databases, programs, literature files and historical databases will be used and accepted by criteria outlined in the following:

- USEPA Hazard Ranking System Guidance Manual, EPA-540-R-92-026, November 1992 (Reference 11).

- USEPA Guidance for Performing Preliminary Assessments Under CERCLA, EPA/540/G-91/013, September 1991 (Reference 12).

- USEPA Guidance for Performing Site Inspections Under CERCLA, EPA540-R-92-021, September 1992 (Reference 13).

The data may include, but is not limited to: site location maps, sample location maps, well databases, public water system databases, appraisal district databases, and deed records.

(B10) DATA MANAGEMENT

Data from analysis of samples by the contract laboratories is validated by EPA for use in the SI reports. EPA maintains full control of record-keeping procedures, receipt of data from the laboratory, and of detecting/correcting laboratory errors.

SECTION C ASSESSMENT/OVERSIGHT

(C1) ASSESSMENT AND RESPONSE

Quality Assurance audits are performed by the PA/SI QAS listed in Figure A.1 or his designee. Functioning as an independent agent, the PA/SI QAS will plan, schedule, and conduct system and process audits. These audits will be implemented to evaluate the capability and performance of project and contractor personnel, activities, and documentation of the measurement system(s), including contractor activities.

The PA/SI QAS will function independently of the PA/SI program. The PA/SI QAS will coordinate and monitor the overall QA program, including on-site activities. Implementing prompt, effective, and accurate corrective action in response to noncompliance that may occur on projects is absolutely essential in assuring the quality of the end product.

ANNUAL QUALITY ASSURANCE ASSESSMENT PLAN

The PA/SI QAS or a designee will perform audits of data quality, management systems reviews (MSR) and field audits annually. The annual QA assessment plan for the PA/SI program is presented in Table C1.

The PA/SI QAS will submit an audit plan to the PA/SI Program Manager at least 15 days prior to the entrance meeting for MSRs and field audits.

CORRECTIVE ACTIONS

The PA/SI Program Manager will develop corrective actions in response to findings of audits conducted by the TCEQ QA Manager or designee, with the assistance of the PA/SI QAS. The PA/SI Program Manager will develop corrective actions in response to findings of audits of field work conducted by the PA/SI QAS or designee. The PA/SI Program Manager will document the corrective actions by memoranda addressed to Superfund Section Management and copied to the PA/SI QAS.

The TCEQ PM will perform corrective actions in response to observations of problems which occur during field activities, and will document the problems and corrective actions in field notes. The PA/SI Program Manager and QAS will determine if further documentation is needed.

The PA/SI QAS is responsible for monitoring the effectiveness of corrective actions and reporting the status to the PA/SI Program Manager and Superfund Section Management.

Table C.1 PA/SI Program Assessment Plan for FY2010

Assessment Type	Scope	Lead Assessor	Frequency	Tracking Number
Audits of Data Quality	The audit will assess the quality of contractor review of CLP data packages and EPA Region 6 laboratory data packages for completeness and technical acceptability of project data. The audit will assess the appropriateness of the professional judgment used to determine data usability. The audit will verify that the requirements of the PA/SI QAPP are met.	Lloyd Johnson or designee	100% of CLP data packages	PASI 10-03.X
Technical Systems Audit (field activities)	The audit will assess the PA/SI staff and contractor activities associated with sample collection.	Lloyd Johnson or designee	2 per FY	PASI 10-01.X
Management Systems Review	The audit will assess the effectiveness of administrative quality controls enacted during the current and previous fiscal years. The MSR will verify that the work implementation requirements of the PA/SI QAPP and the TCEQ QMP are met by the PA/SI program.	Lloyd Johnson or designee	2 per FY	PASI 10-02

(C2) REPORTS TO MANAGEMENT

Audit reports will be written by the QAS after gathering and evaluating all available data. Items, activities, and documents determined by the QAS to be non-compliant with Appendices A through E, References 1-13, 22 and 25, and this QAPP will be identified at interviews conducted with the PA/SI Program Manager. Non-compliant elements will be logged, documented, and controlled through audit findings, which are attached to the audit report. These audit findings are directed to the PA/SI Program Manager to resolve the noncompliance satisfactorily in a specified and timely manner.

The PA/SI Program Manager will plan and implement corrective actions, with the concurrence of the PA/SI QAS. All resolutions shall be approved by the PA/SI QAS prior to completion of the corrective actions. Verification of acceptable resolutions by the PA/SI QAS may be determined by re-audit to document surveillance of the item or activity. Upon verification acceptance, the PA/SI QAS will close out the audit report and findings. It is the PA/SI Program Manager's overall responsibility to ensure that all corrective actions to resolve audit findings are acted upon promptly and satisfactorily by project personnel. The PA/SI QAS will maintain records of all audits and corrective action plans.

The PA/SI QAS can recommend to the Remediation Division Director and PA/SI PMs, and through them to the Deputy Director of the Office of Compliance and Enforcement, that work be stopped in order to safeguard programmatic objectives, worker safety, public health, or environmental protection. The recommendation to stop work will be documented by a memorandum addressed to the PA/SI PM, Superfund Section Management, and/or Remediation Division Director, as appropriate.

The site HASO has the authority to stop work in order to correct any deficiencies concerning human health and worker safety. The notice to stop work will be documented in the field notes by the site HASO and the PA/SI PM, and by email or written communication to the PA/SI Program Manager, Superfund Section Management, and the PA/SI QAS.

The PA/SI PM has the authority to stop work for program objectives, worker safety, public health, or environmental protection. The notice to stop work will be documented in the field notes by the PA/SI PM, and by email or written communication to the PA/SI Program Manager, Superfund Section Management, and the PA/SI QAS.

The PA/SI PM will document in field notes all deviations from this QAPP during field activities, and will record the deviation(s) made and the justification(s) for the deviation(s) in field notes and reports. All planned deviations from this QAPP will be included in the site-specific WP.

The PA/SI QAS will maintain an annual QAPP update schedule listing target dates. The schedule will be consistent with the approval time frames given in Appendix G of the TCEQ QMP.

FIELD AUDIT CHECKLIST

Project No. ________

Project Name ___________________________

Site Investigation Manager _________________________

Auditor __________________________

Dates of Field Audit _/__/__ - _/__/__

A: Health and Safety

1. The Site-Specific Health and Safety Plan has been prepared by the TCEQ Project Manager and subsequently approved by the TCEQ Program Manager and TCEQ Health and Safety Officer prior to arrival to the site.

Yes ___ No ___

Comments____

____

2. The Site-Specific Health and Safety Plan has been signed by the Site Safety Officer and all who intend to enter within the site boundaries prior to entry onto the site.

Yes ___ No ___

Comments____

____

B: Project Organization Adequate ___ Marginal ___ Failed ___

1. Did the Project Manager hold a briefing with each participant to go over any concerns or questions for project organization?

Yes ___ No ___

Comments____

____

2. Did the Project Manager or designee provide appropriate number and types of material supplies necessary to collect samples (jars, bottles, gloves, pens, coolers, coolant, preservatives, protective gear, Work Plan, Health and Safety Plan, CLP, QAPP or other reference material)?

Yes ___ No ___

Comments____

____

3. Were additional instructions given to each participant not otherwise found in the preliminary written material, such as the Site-Specific Work Plan, Health and Safety Plan, CLP or QAPP?

Not Applicable ___

Additional Instructions__________________________________

____

C: Sample Collection Procedures

1a. Did the Project Manager or designee ensure that the sampler collected adequate volumes of sample to allow for the planned sample analyses and field duplicates, plus any laboratory QC blanks and laboratory QC duplicates/spikes, as applicable?

Yes ___ No ___

Comments____

____

1b. Did the Project Manager or designee provide a supply of the appropriate type of sample containers for the samples collected?

Yes ___ No ___ No Modifications ___ Modifications ___

Comments____

____

2. Were samples collected as stated in the Site-Specific Work Plan (number, frequency, and type)?

Yes ___ No ___ No Modifications ___ Modifications ___

Sample Modifications____

____

D: Chain of Custody

1a. Did the Project Manager or designee ensure that the sample tags were properly completed and attached to each sample container?

Yes ___ No ___

Comments____

____

1b. Did the Project Manager or designee ensure that the custody seals were properly completed and attached to each sample container in unbroken condition?

Yes ___ No ___

Comments____

____

1c. Did the Project Manager or designee ensure that each sample container was labeled with the sample number and protected with clear tape?

Yes ___ No ___

Comments____

____

2. Was each completed traffic report faxed to EPA, each original copy mailed to EPA, and copies corrected as necessary?

Yes ___ No ___

Comments____

____

3. Did the traffic report accompany each shipment to the correct EPA contract lab?

Yes ___ No ___

Comments____

____

E: Field Observations

1. Were field observations written in ink and presented accurately in the field logbook, and was each page signed and dated?

Yes ___ No ___

Comments____

____

2. Were photographs logged in the logbook with the date, time, location, name of person taking the picture, direction of photo, type of sample, sample number, and the photo number?

Yes ___ No ___

Comments____

____

3. Prior to use, did the Project Manager or designee ensure that the measuring equipment was calibrated to standard procedures as presented in accompanied documents written specifically for the instrument?

Yes ___ No ___

Comments____

____

4. Have any accountable documents been lost?

Not Applicable ___

Documents Lost____________________________________

____

General Comments or Concerns Regarding the Sampling Procedures, Organization, and Site Investigation Management:

____

____

____

Printed Name of Auditor____________________

Signature of Auditor ______________________ Date____________

SECTION D DATA VALIDATION AND USABILITY

(D1) DATA REVIEW, VERIFICATION, AND VALIDATION

FIELD MEASUREMENT DATA

Field measurements will be made by PMs, field geologists and engineers, environmental analysts, and technicians. Field data will be validated using different procedures.

- Checklists will be used during the processing of data that will identify errors, i.e. identifying errors in identification codes.

- Checks may be made for consistency with parallel data sets (data sets obtained presumably from the same population) - for example, from the same region of the aquifer or volume of soil.

The purpose of these validation checks and tests is to identify outliers, i.e., observations that do not conform to the pattern established by other observations. Outliers may be the result of transcription error or instrumental breakdowns. Outliers may also be manifestations of a greater degree of spatial or temporal variability than expected.

If an outlier is identified, a decision concerning its fate will be rendered. Obvious mistakes in data will be corrected when possible, and the correct value will be inserted. If the correct value cannot be obtained, the data may be excluded. An attempt will be made to explain the existence of the outlier. If no plausible explanation can be found for the outlier, it may be excluded, but a note to that effect will be included in the report. Also, an attempt will be made to determine the effect of the outlier when both included and excluded in the data set.

LABORATORY DATA

The criteria used to review and validate the data are stated in the National Functional Guidelines (NFGs) (References 8-10 and 21). The criteria for accepting, rejecting and qualifying data, and the procedures used for calculations and data reduction, are specified in the NFGs. It will be the responsibility of the laboratory to follow these procedures. The PA/SI QAS will utilize the criteria stated in the NFGs for accepting, rejecting, and qualifying data in order to verify the data validation performed by the ESAT data validators. The NFGs are available online at: http://www.epa.gov/superfund/programs/clp/guidance.htm Scroll down the page, and then click on the link for the pdf file of one of the following guidance documents to be used:

- National Functional Guidelines for Low Concentration Organic Data Review;
- National Functional Guidelines for Organic Data Review;
- National Functional Guidelines for Inorganic Data Review, and
- National Functional Guidelines for Superfund Organic Methods Data Review.

Then use the bookmarks to find the sections regarding accepting, rejecting or qualifying data.

REPORTING

The project analytical report from the laboratory will contain data sheets and the results of analysis of QC samples. Analytical reports may also contain the following items:

- Project identification
- Field sample number
- Laboratory sample number
- Sample matrix description
- Date of sample collection
- Analytical method description and reference citation
- Individual parameter results
- Date of analysis (extraction, first run, and subsequent runs)
- Quantitation limits achieved
- Dilution or concentration factors
- Corresponding QC report (including duplicates and spikes).

Matrix interferences on some of the samples, particularly the waste samples, may result in increased detection limits. Matrix interference will be reported as the cause of increased detection limits.

(D2) VERIFICATION AND VALIDATION METHODS

VALIDATION OF CLP DATA

The laboratory data from CLP laboratories will be validated by EPA according to methods prescribed in the following:

- USEPA National Functional Guidelines for Inorganic Data Review, EPA 540/R-04/004, October 2004 (Reference 8);

- USEPA National Functional Guidelines for Organic Data Review, EPA 540/R-94/12, October 1999 (Reference 9);

- USEPA National Functional Guidelines for Low Concentration Organic Data Review, EPA 540/R/00/006, June 2001 (Reference 10), and

- USEPA National Functional Guidelines for Superfund Organic Methods Data Review, USEPA 540-R-08-001, June 2008 (Reference 21).

The validated data is sent by registered carrier to TCEQ. The data is received and signed for by the TCEQ Mail Room, delivered to the Fiscal, Administrative and Contract Support Section (FACS) of the TCEQ Remediation Division, and date-stamped prior to delivery to the PA/SI GM.

The data validation will be reviewed by the PA/SI QAS. The results of the review will be reported to the PA/SI PM in a Data Assessment Report.

The review by the QAS will be conducted as follows:

- An updated sample rationale provided by the PM will be checked to ensure that sufficient QA/QC samples were collected in the field.

- The field notes collected by the PM will be reviewed to ensure that documentation of field activities was sufficient.

- The CLP traffic report forms will be checked to ensure that all appropriate sample data was recorded and sample custody was maintained. The information will be compared to the Data Assessment Summary prepared by the ESAT data validator.

- The Data Assessment Summary will be compared to the data qualifiers assigned by the ESAT data validator to the results of analyses of the field samples.

- The findings of the QAS will be conveyed to the PM by memorandum. The memorandum will include the site name and location, identification of the sample delivery groups in the data package, discussion of any deficiencies identified during the review and a determination by the QAS if the data are of sufficient quality to meet project objectives.

The PA/SI QAS will contact Marvelyn Humphrey, the EPA Region 6 ESAT Project Officer, for clarification and resolution of any issues. If necessary, ESAT will resubmit appropriate data with corrections.

REVIEW OF USEPA REGION 6 LABORATORY DATA

The laboratory data from the USEPA Region 6 Laboratory will be reviewed by the laboratory manager or designee. Data qualifiers will be assigned according to methods prescribed in the following:

- USEPA National Functional Guidelines for Inorganic Data Review, EPA 540/R-04/004, October 2004 (Reference 8);

- USEPA National Functional Guidelines for Organic Data Review, EPA 540/R-94/12, October 1999 (Reference 9);

- USEPA National Functional Guidelines for Low Concentration Organic Data Review, EPA 540/R/00/006, June 2001 (Reference 10);

- USEPA National Functional Guidelines for Superfund Organic Methods Data Review, USEPA 540-R-08-001, June 2008 (Reference 21);

- USEPA Methods for the Determination of Metals in Environmental Samples Supplement 1 (EPA/600/R-94/111) (Reference 23), and

- USEPA Test Methods for Solid Waste, Chemical/Physical Methods (SW-846), Third Edition with updates I through VIB, February 2007 (revised) (Reference 24).

The qualified data is sent by registered carrier to TCEQ. The data is received and signed for by the TCEQ Mail Room, delivered to the FACS of the TCEQ Remediation Division, and date-stamped prior to delivery to the PA/SI GM.

The data qualification will be reviewed by the PA/SI QAS. The results of the review will be reported to the PA/SI PM in a Data Assessment Report.

The review by the QAS will be conducted as follows:

- An updated sample rationale provided by the PM will be checked to ensure that sufficient QA/QC samples were collected in the field.

- The field notes collected by the PM will be reviewed to ensure that documentation of field activities was sufficient.

- The CLP traffic report forms will be checked to ensure that all appropriate sample data was recorded and sample custody was maintained. The information will be compared to the Report Narrative.

- The Report Narrative will be compared to the results in the Quality Control section of the data package.

- The results in the Quality Control section of the data package will be compared to the data qualifiers assigned by the USEPA Region 6 Laboratory reviewer to the results of analyses of the field samples.

- The findings of the QAS will be conveyed to the PM by memorandum. The memorandum will include the site name and location, identification of the sample delivery groups in the data package, discussion of any deficiencies identified during the review and a determination by the QAS if the data are of sufficient quality to meet project objectives.

The PA/SI QAS will contact Marvelyn Humphrey, the EPA Region 6 ESAT Project Officer, for clarification and resolution of any issues. If necessary, ESAT will resubmit appropriate data.

(D3) RECONCILIATION WITH USER REQUIREMENTS

For each site, the PA/SI QAS will review the data validation performed on CLP data by the EPA Region 6 ESAT data validators. The PA/SI QAS will also review the USEPA Region 6 Laboratory data qualified by the laboratory manager or designee. Inconsistencies will be reported to the appropriate EPA ESAT staff for reconciliation. The PA/SI QAS will determine whether the data are sufficient to achieve project objectives, and will convey the findings to the PM.

The following procedures have been established to assure that conditions adverse to quality, i.e. malfunctions, deficiencies, deviations, and errors, are promptly investigated, evaluated, and corrected.

INITIATION OF CORRECTIVE ACTION

When a condition adverse to quality is noted at the project site, laboratory, or subcontractor locations, the cause of the condition will be determined and corrective action taken to preclude repetition. All project personnel have the responsibility, as part of normal work duties, to promptly identify, solicit approved correction, and report conditions adverse to quality.

Corrective actions may be initiated at a minimum:

- When predetermined acceptance standards, such as objectives for precision, accuracy, and completeness, are not attained.
- When procedures or data compiled are determined to be faulty.
- When equipment or instrumentation is found faulty.
- When samples and test results cannot be traced with certainty.
- When quality assurance requirements have been violated.
- When designated approvals have been circumvented.
- As a result of an audit.

PROCEDURE DESCRIPTION

Project management and staff, including field investigation teams, sample control personnel, and laboratory groups, shall monitor ongoing work performance in the normal course of daily responsibilities.

Following identification of an adverse condition or quality assurance problem, notification of the deficiency will be made to the project manager and senior individual in charge of the activity found to be deficient, along with recommendations for correction. Following implementation of corrective action, the senior individual in charge will report actions taken and results to the PA/SI Program Manager and PA/SI QAS.

EQUATIONS FOR PRECISION, ACCURACY, AND COMPLETENESS

Planned procedures used to assess data precision and accuracy are in accordance with 44 CFR 69533, "Guidelines Establishing Test Procedures for the Analyses of Pollutants", and appendix III, "Example Quality Assurance and Quality Control Procedures for Organic Priority Pollutants", December 3, 1979. Completeness is recorded by comparing the number of parameters initially analyzed with the number of parameters successfully completed and validated.

PRECISION

Relative percent difference (RPD) is calculated as:

$$RPD = \frac{|X_1 - X_2| \times 100\%}{(X_1 + X_2)/2}$$

Where:
X_1 = analyte concentration of first duplicate
X_2 = analyte concentration of second duplicate

ACCURACY

Accuracy is expressed as a percent recovery (PR), calculated by:

$$PR = \frac{(A-B)}{C} \times 100\%$$

Where:
A = spiked sample result (SSR)
B = sample result (SR)
C = spike added (SA).

REPRESENTATIVENESS

The requirements of the data user include establishing observed releases and observed contamination in order to determine an HRS pathway score. The Hazard Ranking System Guidance Manual provides guidance for collecting representative samples (Reference 11). Judgmental samples will be collected, rather than samples collected based on statistical methodology. Samples will be collected at and adjacent to areas of known or suspected contamination, such as retention ponds, container storage, stained soil, or stressed vegetation. These will be compared to background samples collected offsite or upgradient of the areas of known or suspected contamination.

COMPLETENESS

The completeness of the data will be determined by:

$$PC = \frac{N_a}{N_t} \times 100\%$$

Where:
PC = percent complete
N_a = number of actual valid results
N_t = number of theoretical results obtainable.

Reference List

LIST OF REFERENCES

1. EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5, March 2001

2. Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA/G-4, February 2006.

3. Guidance for Quality Assurance Project Plans, EPA QA/G-5, December 2002.

4. USEPA Contract Laboratory Program Statement of Work for Inorganics Analysis, Revision No. ILM05.3, March 2004.

5. USEPA Contract Laboratory Program Statement of Work for Organics Analysis, Revision No. OLM04.3, August 2003.

6. USEPA Contract Laboratory Program Statement of Work for Low Concentration Organics Analysis, Revision No. OLC03.2, June 2001.

7. USEPA Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration SOM01.1, May 2005 with Modifications Updating SOM01.1 to SOM01.2, October 5, 2006.

8. USEPA National Functional Guidelines for Inorganic Data Review, EPA 540-R-04-004, October 2004.

9. USEPA National Functional Guidelines for Organic Data Review, EPA 540/R-94/012, October 1999.

10. USEPA National Functional Guidelines for Low Concentration Organic Data Review, EPA-540-R-00-006, June 2001.

11. USEPA Hazard Ranking System Guidance Manual, EPA-540-R-92-026, November 1992.

12. USEPA Guidance for Performing Preliminary Assessments Under CERCLA, EPA/540/G-91/013, September 1991.

13. USEPA Guidance for Performing Site Investigations Under CERCLA, EPA540-R-92-021, September 1992.

14. TCEQ Quality Management Plan, Revision 11, January 2006.

15. "Hazard Ranking System, Final Rule." *Federal Register* 55:241 (December 14, 1990) p. 51532.

16. USEPA Improving Site Assessment: Pre-CERCLIS Screening Assessment, EPA-540-F-98-039, October 1999.

17. Regional Quality Control Guidance for NPL Candidate Sites, December 1991.

18. USEPA Region 6 CLP Training Manual, August 2001.

19. USEPA Management of Investigation-Derived Wastes During Site Inspections, EPA/540/G-91/009, May 1991.

20. USEPA Improving Site Assessment: Combined PA/SI Assessments, October 1999.

21. USEPA National Functional Guidelines for Superfund Organic Methods Data Review, USEPA 540-R-08-001, June 2008.

22. USEPA ILM05.3 to ILM05.4 Summary of Changes, December 1, 2006.

23. USEPA Methods for the Determination of Metals in Environmental Samples Supplement 1 (EPA/600/R-94/111).

24. USEPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846), Third Edition with updates I through VIB, February 2007 (revised).

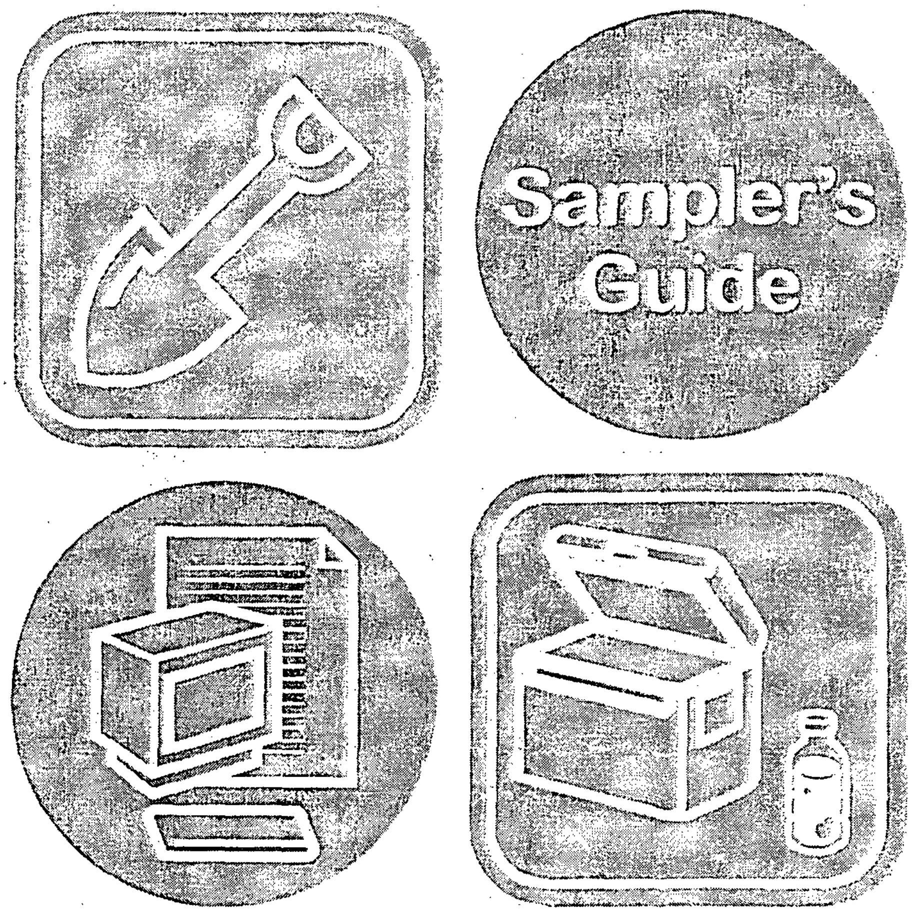
25. USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration), Revision No. ISM01.1, July 2008.

Appendix A -
Contract Laboratory Program Guidance for Field Samplers
July 2007, with appendices

OSWER 9240.0-44
EPA 540-R-07-06

FINAL July 2007

Office of Superfund Remediation and Technology Innovation



Contract Laboratory Program Guidance for Field Samplers

Disclaimer: The final version of the document replaces any prior versions of the document in their entirety.

Foreword

The intent of the Contract Laboratory Program (CLP) Guidance for Field Samplers is to replace the CLP Samplers Guide. This guidance document is designed to provide users with general information regarding environmental sample collection for the United States Environmental Protection Agency's (USEPA) Contract Laboratory Program (CLP). This document provides minimum CLP requirements, an explanation of the general sampling process sequence of events, and any related information. The appendices contain useful reference information and checklists to aid in planning and documenting sampling activities.

CLP users also are encouraged to review the Introduction to the Contract Laboratory Program document that contains a general overview of the CLP, how it works, and how to access the program. The CLP requires samplers to use the functionality provided by the Field Operations Records Management System (FORMS) II Lite™ software, which is the preferred means of creating CLP sample documentation. For guidance in using the software to record and submit sampling data, users should reference the FORMS II Lite User's Guide.

Both the Introduction to the Contract Laboratory Program and the Contract Laboratory Program Guidance for Field Samplers can be downloaded from the CLP Web site at the following address:

http://www.epa.gov/superfund/programs/clp/guidance.htm

The FORMS II Lite User's Guide can be downloaded from the CLP Web site at the following address:

http://dyncsdao1.fedcsc.com/itg/forms2lite/doc.html

For more information regarding the CLP or this guide, please contact Elizabeth Holman via email at Holman.Elizabeth@epa.gov or via telephone at (703) 603-8761.

Key Information

Text in blue and underlined indicates an external link to information outside of this document.

The images below are located throughout the document to draw attention to important information and each are labeled accordingly:

Important

Note

Table of Contents

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List of Figures

List of Tables

ASB	Analytical Services Branch
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
CLP PO	CLP Project Officer
CRQL	Contract Required Quantitation Limit
CVAA	Cold Vapor Atomic Absorption
DOT	Department of Transportation
DQO	Data Quality Objective
dbf	Database File
ET	Eastern Time
FORMS II Lite™	Field Operations Records Management System II Lite
FSP	Field Sampling Plan
HCN	Hydrocyanic acid
IATA	International Air Transport Association
ICP-AES	Inductively Coupled Plasma-Atomic Emission Spectroscopy
ICP-MS	Inductively Coupled Plasma-Mass Spectrometry
MS	Matrix Spike
MSD	Matrix Spike Duplicate
$NAHSO_4$	Sodium Bisulfate
NPL	National Priorities List
OSC	On-scene/on-site Coordinator
OSHA	Occupational Safety and Health Administration
OSRTI	Office of Superfund Remediation and Technology Innovation
OSWER	Office of Solid Waste and Emergency Response
PCBs	Polychlorinated Biphenyls
PE	Performance Evaluation
PM	Program Manager
ppb	Parts-Per-Billion
ppt	Parts-Per-Trillion
PRP	Potentially Responsible Party
PT	Proficiency Testing
PTFE	Polytetrafluoroethylene
PVC	Polyvinyl Chloride
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QASPER	Quality Assurance Sampling Plan for Environmental Response
QATS	Quality Assurance Technical Support
QC	Quality Control
RAS	Routine Analytical Services
RPM	Remedial Project Manager
RSCC	Regional Sample Control Center Coordinator
RSM	Regional Site Manager
SAM	Site Assessment Manager
SAP	Sampling Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SDG	Sample Delivery Group
SMC	System Monitoring Compound
SMO	Sample Management Office
SOP	Standard Operating Procedure
SOW	Statement of Work
SVOA	Semivolatile Organic Analyte
TR/COC	Traffic Report/Chain of Custody
txt	Text File
UN	United Nations
USEPA	United States Environmental Protection Agency
VOA	Volatile Organic Analyte
XML	eXtensible Markup Language

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1.0 INTRODUCTION

1.1 About this Guide

This document describes the important organizational roles and responsibilities for those who plan and conduct environmental sample collection projects for analysis through the Superfund's Contract Laboratory Program (CLP). This chapter introduces the structure and purpose of this document. Chapter 2, *Pre-field Activities*, addresses pre-field planning activities that the sampling team could complete prior to the actual sampling event. Chapter 3, *In-field Activities*, addresses those activities that need to be completed during the sampling event.

Appendix A describes the functions within a sampling project which are taken from the Quality Assurance Project Plan requirements. Appendix B and Appendix C contain the sample collection guidelines for Volatile Organic Analytes (VOAs) in soil and in water. Appendix D recommends sampling techniques. Appendix E contains checklists to help the sampler ensure that all necessary steps are completed.

Note: A project and site-specific Quality Assurance Project Plan (QAPP) providing Regional guidance will override guidance given within this document.

1.2 Overview of the CLP

The CLP is a national program of commercial laboratories under contract to support the USEPA's nationwide effort to clean up designated hazardous waste sites by supporting its Superfund program. The Superfund program was originally established under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and presently exists under the Superfund Amendments and Reauthorization Act (SARA) of 1986.

The CLP uses state-of-the-art technology to provide users with analytical services. The program provides data of known and documented quality to support USEPA enforcement activities or other user needs. To achieve this goal, the CLP has established strict Quality Control (QC) procedures and detailed documentation requirements. Current CLP users include the USEPA Regions, States and Tribal governments, and other Federal agencies. CLP users also are encouraged to review the *Introduction to the Contract Laboratory Program* document that contains a general overview of the CLP, how it works, and how to access the program.

1.2.1 Key Players Within the CLP

In coordinating Superfund sampling efforts, the Analytical Services Branch (ASB) is supported by the Sample Management Office (SMO) contractor, the Regional CLP Project Officers (CLP POs), the *Regional Sample Control Center Coordinators (RSCCs), and the Regional Site Managers (RSMs),* including Site Assessment Managers (SAMs), On-scene/On-site Coordinators (OSCs), and Remedial Project Managers (RPMs). Samplers may work directly with the RSCC and/or RSM (or equivalent), and/or an OSC from the Field Support Section during a sampling event. See Table 1-1 for a brief description of the functions performed by key participants (functions may vary by Region).

Table 1-1. Participants in the CLP Sampling Process

<table>
<tr><th>Participants</th><th>Responsibilities</th></tr>
<tr><td>Analytical Services Branch</td><td>USEPA ASB directs the CLP from within the Office of Superfund Remediation and Technology Innovation (OSRTI) in the Office of Solid Waste and Emergency Response (OSWER). ASB responsibilities include:
Development of the Statements of Work (SOWs) that define required analytical methods (including QC, detection/quantitation limits, and holding times) for the analytical services procured under the CLP;
Development and implementation of policies and budgets for Superfund analytical operations;
Development of information management policies and products for analytical data;
Management of SMO and Quality Assurance Technical Support (QATS) contracts;
National administration, evaluation, and management of the CLP; and
Direction of CLP Quality Assurance (QA) activities in coordination with overall OSWER QA activities.
To obtain the most current ASB contact list, refer to the following Web site:
http://www.epa.gov/superfund/programs/clp/contacts.htm#ASB</td></tr>
<tr><td>CLP Sample Management Office</td><td>The contractor-operated SMO provides necessary management, operations, and administrative support to the CLP. SMO receives Regional analytical requests, coordinates and schedules sample analyses, and tracks sample shipments. SMO also receives and checks data for completeness and compliance, processes laboratory invoices, and maintains a repository of sampling records and program data.</td></tr>
<tr><td>CLP Contract Laboratories</td><td>The contractor-operated laboratories within CLP provide necessary analytical services for the isolation, detection, and quantitation of the CLP's target compounds and analytes.</td></tr>
<tr><td>Regional CLP Project Officer</td><td>The CLP PO monitors the technical performance of the contract laboratories in each Region. The CLP PO works closely with ASB Program Managers (PMs) to identify and resolve laboratory technical issues, and leads laboratory on-site evaluations. To obtain the most current CLP PO contact list, refer to the following Web site:
http://www.epa.gov/superfund/programs/clp/polist.htm</td></tr>
<tr><td>Regional Sample Control Center Coordinator</td><td>In most Regions, the RSCC coordinates sampling efforts and serves as the central point-of-contact for sampling questions and problems. The RSCC works with SMO to schedule sample shipments to laboratories. In addition, the RSCC's activities may include: informing SMO of sample shipment, cancellations, special instructions, and sampling issues. To obtain the most current RSCC contact list, refer to the following Web site:
http://www.epa.gov/superfund/programs/clp/rscclist.htm</td></tr>
<tr><td>Regional Site Manager</td><td>The RSM Coordinates the development of acceptance or performance criteria and oversees project-specific contractors, state officials, or private parties conducting site sampling efforts. The RSM could be the SAM, the OSC, or the Remedial Project Manager (RPM).</td></tr>
<tr><td>Field Support Section</td><td>The Field Support Section consists of personnel such as the OSC, SAM, and RPM. In most Regions, the Field Support Section develops Standard Operating Procedures (SOPs) for field sampling and related procedures, and assists sampling teams in following those SOPs. The sampling team determines what type(s) of CLP services will be required for a particular sampling event. The Field Support Section reviews Sampling Analysis Plans (SAPs) prepared by sampling teams and oversees sampling teams in the field. The Field Support Section may also prepare their own SAPs, perform sampling activities in the field, and analyze and report the results of their sampling events to the RSM.</td></tr>
</table>

1.3 Overview of the Sampling Process

> **At–a-Glance:**
> **Overview of the Sampling Process**
> ✓ Procedures must be consistent.
> ✓ Analytical data must be accurate and defensible.
> ✓ Procedures must meet minimum requirements.

Once USEPA has determined that physical, chemical, and/or biological testing of a site is necessary, samples of material from the site area must be collected. The type of material that must be collected and the analytical method to be used depends upon the physical location of the site, detection level(s), site history (previous sampling), and known or unknown conditions and contaminants. The sampling process includes carefully planned and consistently applied procedures that produce accurate and legally defensible data. The sampling team should consider the procedures and plans presented in this guide as minimum sampling process guidelines to maintain sample integrity and identity. Samples should be collected according to the approved project and site-specific QAPP and SAP. This document does not define specific sampling procedures because specific sampling protocols depend on individual site conditions, Regional requirements, and acceptance and performance criteria. Since Regions may have their own specific requirements for individual sampling programs, they are responsible for generating Region-specific sampling SOPs.

1.3.1 Procedures Must be Consistent

The purpose of sampling is to collect representative portions from a suspected contaminated site. Sample collection is critical to determining the presence, type, concentration, and extent of environmental contamination by hazardous substances, thus it is a crucial part of every sampling and environmental testing effort. Sampling procedures must be consistently written and followed to mitigate risk of error and the expense of re-sampling.

Failure to follow proper sampling and shipping procedures could result in samples that are contaminated, broken, mislabeled, lost during shipping, or unusable because of a missed holding time. If procedures are inconsistently or improperly followed, any resultant analytical data may be inaccurate and may not be defensible in a court of law.

Note: If re-sampling is needed due to improper sampling, the sampling team may incur the cost.

1.3.2 Analytical Data Must be Accurate and Defensible

The data gathered during sampling activities helps to accurately characterize contaminated waste sites so that the impact on human health and the environment can be properly evaluated. Acquiring accurate and defensible data that will be accepted in a court of law is the CLP's primary objective; therefore, the sampler must collect samples according to strict sampling procedures, plans, and guidelines. USEPA and many other Federal agencies use data resulting from analytical testing of soil/sediment/aqueous samples to:

- Determine if a site is contaminated with organic and/or inorganic compounds;
- Identify pollution sources and Potentially Responsible Parties (PRPs);
- Validate remedial design methodologies;
- Assess response and remedial priorities;
- Assess risk to human health and the environment;
- Determine appropriate cleanup actions; and
- Determine cleanup achievements.

1.3.3 Sampling Procedures and Guidelines Must Meet Minimum Requirements

It is imperative that samplers be aware of the minimum CLP and Regional requirements that directly impact and define how a sampling event will take place. It is important to note that the procedures and guidelines set forth in this document are considered minimum CLP requirements. Samplers should reference the following sections within this document that specifically address important requirements that must be met for a successful sampling event:

- Section 1.4.1 CLP Documentation Requirements;
- Section 2.4.1 Request Scheduling of Analysis, SMO-assigned Case Numbers, CLP Sample Numbers, and Laboratory Contact Information;
- Section 2.7 Comply with Transportation and Shipping Requirements;
- Section 2.8 Provide Shipment Notification;
- Section 3.1 Collect Samples; and
- Section 3.2 Complete Documentation.

1.4 Overview of Sampling Documentation Requirements

The sampler must properly document samples collected for analysis in order to uniquely identify each sample and ensure adequate chain-of-custody procedures. When collecting samples, the sampler should always keep in mind that any samples collected may be used in future litigation. This is especially important when samples are from privately owned property. If sampling on privately owned property, samplers should also provide the property owner with a receipt for samples collected and removed from that owner's property. Samplers may also be required by a Region to use a sample label, sample tag, or field operations records documenting information such as daily activities, equipment and materials used, personnel involved, site security, etc. These types of documentation help ensure proper sample identification and provide additional chain-of-custody records.

The documentation required by a Region for a sampling event is outlined in project plans such as the QAPP, SAP, and Field Sampling Plan (FSP).

At–a-Glance:
Overview of the Sampling Document Requirements

✓ Must use FORMS II Lite to create sample documentation. Analytical data must be accurate and defensible.

✓ CLP documentation requirements:
- CLP Sample Number
- SMO-assigned Case Number
- Traffic Report/Chain of Custody (TR/COC) Record
- Sample Labels
- Sample Tags
- Custody Seals
- Field Operation Records

Under no circumstances should the site name appear on any documentation that is sent to the laboratory (for the CLP).

1.4.1 CLP Documentation Requirements

Samplers must:

1) Record the CLP Sample Number on each sample bottle;
2) Complete the Traffic Report/Chain of Custody (TR/COC) Record using the FORMS II Lite software, making sure to indicate on the TR/COC Record if the samples require the use of a Modified Analysis;
3) Complete and attach sample labels;
4) Complete and attach sample tags to meet Regional requirements;
5) Complete and attach custody seals to meet Regional requirements; and
6) Complete field operations records, as necessary.

Please contact your RSCC (see Table 1-1) for information regarding CLP Sample Numbers, SMO-assigned Case Numbers, TR/COC Records, and chain-of-custody seals for sampling events.

For information regarding using FORMS II Lite to create and complete a TR/COC Record, refer to the following Web site:

http://www.epa.gov/superfund/programs/clp/f2lite.htm

1.4.1.1 CLP Sample Number

A CLP Sample Number is unique per sampling location and is used to identify and track samples throughout the sampling and analytical processes and is recorded on many types of sampling documentation (e.g., TR/COC Records, sample labels, and sample tags). CLP Sample Numbers are provided to samplers by their RSCC or SMO.

Samplers must contact their RSCC (or their designee) to obtain CLP Sample Numbers for their sampling event. Samplers must correctly assign the CLP Sample Numbers to the appropriate sample bottle or container. Please refer to Section 3.2.1 for more detailed information regarding the use of CLP Sample Numbers.

Note: If the sampler has any questions regarding the assignment of CLP Sample Numbers, they should contact their RSCC.

1.4.1.2 SMO-assigned Case Number

SMO-assigned Case Numbers are used to track groups of samples throughout the sampling and analytical processes and are recorded on many types of sampling documentation (e.g., TR/COC Records, sample labels, and sample tags). Samplers must correctly assign the SMO-assigned Case Number to the appropriate sample bottle or container. To obtain a SMO-assigned Case Number, samplers must contact their RSCC (or their designee).

1.4.1.3 Laboratory Assignment

Samplers are responsible for shipping samples to the appropriate SMO-assigned laboratory for analysis. Samplers must contact their RSCC (or their designee) to obtain their laboratory assignment or they may be provided by SMO.

1.4.1.4 TR/COC Record

The TR/COC Record is used as physical evidence of sample custody and functions as a permanent record of each sample collected.

Per CLP documentation requirements, each cooler must contain a TR/COC Record that lists all the samples contained therein.

In an effort to automate sample documentation in the field, ASB has developed a stand-alone, Windows-based software application that samplers can use to automatically create and generate sample documentation. The FORMS II Lite software allows users to enter information prior to and during sampling events. It allows users to multi-task and electronically create, edit, and print documentation associated with sampling activities. Users can customize data entry screens throughout the entire documentation process. Users can also customize the format and content of sample labels based on specific requirements.

The program simplifies and accelerates the tedious manual sample documentation process by reducing the generation of handwritten documents by almost 70%. The FORMS II Lite software enables samplers to:

- Increment CLP Sample Numbers or manually assign their own unique, project-specific non-CLP Sample Numbers;
- Input the SMO-assigned Case Number into the appropriate field;
- Create sample labels, sample tags, TR/COC Records, Sample Weight forms, and receipts for samples taken from a site;
- Track samples from the field to the laboratory;

- Electronically capture sample information into databases; and
- Export electronic data as a database File (.dbf), Text (.txt), or eXtensible Markup Language (.xml) file.

USEPA requires samplers to use the FORMS II Lite software for all CLP sampling efforts. For assistance with obtaining or using the FORMS II Lite software, please contact the FORMS II Lite Help Desk at 703-818-4200 from 9:00 AM - 5:00 PM Eastern Time (ET). For additional information regarding FORMS II Lite use and training, please refer to the following Web site:

http://www.epa.gov/superfund/programs/clp/f2lite.htm

1.4.1.5 Chain-of-Custody Seals

A chain-of-custody seal is any adhesive label or tape that can be used to seal a sample bottle, container, plastic bag, or shipping cooler such that if it is opened or tampered with, the seal will be broken. Custody seals must be placed on each sample bottle, container, or bag (as appropriate) and each shipping cooler or container. The custody seal is an excellent means of maintaining a record of chain-of-custody, as well as guarding against possible sample contamination or tampering during shipping.

1.4.1.6 Sample Labels

A sample label is a sticker attached to a sample bottle or container that contains a sample. Sample labels are affixed to each sample container as samples are collected in the field or affixed prior to going in the field. A sample label must contain, at a minimum, a CLP Sample Number so that they can be associated with, and listed on, the associated TR/COC Record. The sample label may also include the required analysis/fraction and preservative used (to eliminate confusion at the laboratory). Samplers should refer to their project plans for Region-specific sample label requirements.

1.4.1.7 Sample Tags

A sample tag identifies a sample bottle or container that contains a sample. The tag also provides specific analytical direction and proof that a sample existed. To support the use of sample data in potential enforcement actions, samples with other than in situ measurements (e.g., pH, temperature, conductivity) can be identified with a sample tag. A CLP Sample Number and SMO-assigned Case Number must be recorded on a sample tag to indicate that the sample container comprises the whole sample in the case where there is just one container of sample, or part of the indicated sample in the case of multiple containers of sample. Samplers should refer to their project plans for Region-specific sample tag requirements.

1.4.1.8 Field Operation Records

Samplers should maintain complete, accurate, and legible field operations records as they perform a sampling activity. The following records are included: Field Logbooks; Corrective Action Reports; Sampling Trip Reports; supplemental standardized forms; logs; and records such as maps or photographs that document each step of the work performed in the field. Samplers should refer to their project plans for Region-specific field operations record requirements. These records are very important tools because they are considered part of the official project file when legal issues arise.

1.4.1.9 Weight Logs

A sample weight log identifies the tared, sample and final weights per bottle for VOA samples. In order to support Method 5035 for VOAs, samplers should enter tared and final weights per bottle in the CLP Sample Weight Log.

2.0 PRE-FIELD ACTIVITIES

At-a-Glance:
Pre-field Activities

- ✓ Prepare for and communicate during a sampling event.
- ✓ Review project plans containing Regional requirements.
- ✓ Plan to meet documentation requirements.
- ✓ Obtain any necessary permits, licenses, and clearances.
- ✓ Identify and obtain sampling materials.
- ✓ Comply with transportation and shipping requirements.
- ✓ Provide shipment notification.
- ✓ Perform Readiness Review/Run-through.

This chapter provides instructions for completing the suggested pre-field activities that samplers could complete prior to performing sampling activities. These important pre-field activities will save time and help the sampler to better prepare for the sampling event. Samplers should be aware of issues routinely arise during the sampling process so that samplers can avoid making the same mistakes or having the same problems that could adversely affect their sampling event. Samplers are also expected to review all pertinent project plans and meet both CLP and Regional requirements that directly impact the structure and purpose of a sampling event.

The project plans provide information such as the types and numbers of samples to be collected, the analytical methods to be used based on the desired level of quantitation, and the necessary equipment and supplies. The plans also describe the sampling method which may require different specific sample volumes/masses, containers, preservation, shipping, and handling to maintain the integrity of the samples without degradation or contamination.

In addition to reviewing project plans, samplers should determine if the sampling site is privately or publicly owned and obtain the necessary permission to access the sampling site. If the site is privately owned, samplers should make sure to have receipts for available samples to provide to the owner for all samples collected and removed from their property. Samplers must also prepare to identify and obtain sampling materials, prepare to meet documentation requirements by obtaining and learning to use the required software, comply with transportation and shipping requirements, and perform a readiness review/dry run of the sampling process.

2.1 Prepare for a Sampling Event

Samplers must prepare to meet CLP and Regional requirements for a sampling event, appropriately use the CLP Sample Number and SMO-assigned Case Number, complete the TR/COC Record using the FORMS II Lite software, and complete and attach the custody seal(s). It is very important that the sampler include the correct CLP Sample Number on each sample. It is also imperative that the TR/COC Record be accurately completed and submitted with the sample(s). Finally, the sampler must accurately and legibly complete and attach a custody seal to each sample container, or plastic sample bag (as appropriate), and each shipping cooler or container.

However, meeting the sampling requirements requires more than just the proper application of a CLP Sample Number on each sample, completion of the TR/COC Record, and use of a custody seal. The actual collection of samples, packaging, and shipping of those samples are equally important to a successful sampling event.

For example, if a sampler collects an insufficient volume of a sample, the laboratory may not be able to perform the requested analysis. Insufficient sample volumes may also result in a laboratory being unable to perform laboratory quality control, such as Matrix Spike (MS), Matrix Spike Duplicate (MSD), and Duplicate sample analysis. Additionally, if the laboratory receives a sample that is either unpreserved or the sample pH is outside of the required range, the sample cannot be properly analyzed.

Unfortunately, improper shipping and labeling processes and procedures often result in:

- Samples being shipped to the wrong laboratory;
- Broken or empty samples being received at the laboratory; and
- Custody seals or sealant tape that is missing or broken on sample bottles, containers, plastic bags, or shipping coolers shipped to the laboratories.

The importance of completing the paperwork associated with a sampling event cannot be overemphasized. Samplers must make a conscientious effort to accurately complete the TR/COC Record since this is the main document used to derive vital information about a particular sample. The person completing a TR/COC Record must be careful to avoid errors such as the appropriate sample(s) not being listed, or the wrong samples being listed. In an effort to eliminate such errors and the confusion that can be associated with handwritten TR/COC Records, samplers must use the FORMS II Lite software to complete the TR/COC Record and other associated sampling documentation.

It is extremely important that QC samples, including field sample duplicates, field samples for Matrix Spike and Matrix Spike Duplicate analyses, and Proficiency Testing (PT) samples, also known as Performance Evaluation (PE) samples, be designated and labeled per Regional guidance by samplers in the field. Mislabeling of QC samples can result in improper and/or inaccurate analysis of a sample at the laboratory.

2.2 Communicate During a Sampling Event

Communication is a key element in planning, administrating, and conducting a sampling event. It is extremely important that all parties involved in a sampling event be in contact throughout the sampling process. The procedures and recommendations outlined in this guide are based on more than 20 years of experience. It has been demonstrated that approximately 50% of all sampling efforts have been negatively affected by incorrect sampling procedures and poor communication among participants.

The key elements of communication for a sampling event include the relationship between the RSCC, SMO, the samplers in the field, and the laboratories who will be accepting the samples. For instance, the samplers must contact the RSCC to start the process for setting up a sampling event. The RSCC will in turn contact SMO who will schedule the sampling event, establish laboratory availability, and arrange for the laboratory to accept projected samples. SMO will then communicate the laboratory assignment to the Region and possibly the sampler.

The sampler should contact the RSCC (per Regional guidelines) and allow enough time for the RSCC to contact SMO at least a week prior to the sampling event.

SMO provides SMO-assigned Case and CLP Sample Numbers in time for the sampling event. SMO also schedules a laboratory and makes sure the laboratory will not have any capacity problems. Communication is also important because if there is a change in the sampling event due to a cancellation or an increase or decrease in the number of samples that will be sent to the laboratory, the sampler can contact the RSCC who can work with SMO to remedy potential capacity, availability, or overbooking problems.

2.3 Review Project Plans Containing Regional Requirements

In addition to meeting CLP requirements, the sample collection process must fulfill numerous Regional requirements. These requirements are determined by a variety of factors that affect how samples should be collected for an individual sampling event. These factors include:

- The type of samples being collected (organic/inorganic, water, soil/sediment, etc.);
- The method by which the samples will be analyzed;
- The acceptance or performance criteria (i.e., Data Quality Objectives [DQOs]); and
- The type of data needed.

The QAPP for each sampling project is written to meet requirements outlined in the documents *EPA Requirements for Quality Assurance Project Plans* (QA/R-5), *EPA Guidance on Quality Assurance Project Plans* (G-5), and Regional QAPP preparation documents. The QAPP is prepared in advance of field activities and is used by samplers to develop any subsequent plans such as the Sampling SAP or the FSP. Samplers should review the QAPP and any subsequent project plans for information outlining the basic components of a sampling activity. QAPP and project plans should be finalized and approved by appropriate Regional QA personnel, the OSC, SAM, or the RPM before providing them to the sampling team. This should be done prior to the start of field activities. Appendix A explains the functions within a sampling project (as these functions relate to a sampling event) and the elements of that function as described in a typical QAPP. Copies of all project plans and relevant SOPs should be maintained in the field for the duration of the sampling project.

2.4 Plan to Meet Documentation Requirements

> **At-a-Glance:**
> **Plan to meet documentation requirements.**
> ✓ Request SMO-assigned Case and CLP Sample Numbers;
> ✓ Prepare sample cooler return documentation.
> ✓ Prepare to use the FORMS II Lite software.

Sampling events require a variety of accurate and complete documentation. Samplers should review their project plans to determine the types of documentation that must be completed for a sampling project and to ensure that the appropriate documentation will be on-hand in the field. The CLP documentation requirements include the CLP Sample Number, the SMO-assigned Case Number, the TR/COC Record, sample labels, sample tags, custody seals, and field operations records (as necessary). Samplers need to request SMO-assigned Case and CLP Sample Numbers for each sampling event prior to starting field activities. Samplers also need to make sure that the correct TR/COC Records (Organic TR/COC Record for organic analysis or Inorganic TR/COC Record for inorganic analysis) are being used within the FORMS II Lite software. Finally, samplers should be prepared to complete the appropriate shipping cooler return documentation.

Since samplers are required to use the FORMS II Lite software to prepare and submit sampling project documentation and maintain sample chain-of-custody, software users must be familiar with all emergency back up procedures that should be followed in the event of a system failure. Samplers must have access to FORMS II Lite-generated TR/COC Records at sampling events. If problems are experienced while using the FORMS II Lite software, please contact the FORMS II Lite Help Desk at 703-818-4200 from 9:00 AM - 5:00 PM ET.

In the event of a system crash, samplers must have backup hardcopies of FORMS II Lite TR/COC Records. For information regarding emergency backup procedures, please refer to the following Web site:

http://www.epa.gov/superfund/programs/clp/trcoc.htm

2.4.1 Request Scheduling of Analysis, SMO-assigned Case Numbers, CLP Sample Numbers, and Laboratory Contact Information

SMO-assigned Case Numbers are assigned based on a request for CLP Routine Analytical Services (RAS), which is processed though the RSCC (or his/her designee). The sampler must request the RSCC to schedule CLP RAS analysis. The CLP does have the capacity to schedule sampling on an emergency basis, however the sampler must contact the RSCC (or his/her designee) to obtain details regarding how to handle such a situation. When scheduling a sampling event that will last for more than one week, it is recommended that the sampler contact the RSCC (or his/her designee) on a weekly basis to provide updates. This contact between the sampler, the RSCC (or his/her designee), and SMO is very important because it will ensure better availability of laboratory capacity.

In addition to SMO-assigned Case and CLP Sample Numbers, samplers should make sure to have accurate laboratory contact information, such as:

- Laboratory name;
- Laboratory address;
- Contact name; and
- Laboratory phone number.

This information is used for both TR/COC Records and chain-of-custody documentation and shipping paperwork such as address labels and airbills.

The SMO-assigned Case Number is used to track groups of samples throughout the sampling and analytical processes. Samplers must correctly indicate the assigned Case Number on the appropriate sample bottle or container.

Note: The RSCC (or his/her designee) provides the CLP Case Numbers and Sample Numbers for each sampling event to samplers. Once the CLP Sample Numbers have been provided to the sampler, the sampler can use FORMS II Lite to print them onto sample labels.

The following characters are not to be used in generating CLP Sample Numbers and should never appear on any paperwork submitted to the laboratory: I, O, U, and V.

A CLP *Sample Number* is defined as a number that is unique per sampling location and identifies each CLP sample (see Section 1.4.1.1). Since samples must be identified per analytical program (either organic or inorganic), there are two types of TR/COC Records and two letter codes to denote organic vs. inorganic analysis.

A CLP *sample* is defined as one discrete portion of material to be analyzed that is contained at one concentration level, from one station location for each individual or set of analytical fractions -- provided the fractions are all requested for the same CLP analytical service (i.e., organic or inorganic), and identified by a unique Sample Number.

Note: When samples are collected from several station locations to form a composite sample, the composite sample should be assigned either a number from one of the station locations used during collection, or a unique number that represents the composite sample for tracking purposes. The numbering scheme used internally at a sampling event for identifying composite samples should also be documented appropriately (e.g., in the field logs).

Organic CLP Sample Numbers begin with the Regional letter code, followed by four letters and/or numbers. Inorganic CLP Sample Numbers begin with "M", followed by the Regional letter code and then four letters and/or numbers. See Table 2-1 for Region and letter codes for each sample type (i.e., organic or inorganic).

Table 2-1. CLP Sample Number Letter Codes

Region	Letter Code	
	Organic	Inorganic
1	A	MA
2	B	MB
3	C	MC
4	D	MD
5	E	ME
6	F	MF
7	G	MG
8	H	MH
9	Y	MY
10	J	MJ

According to CLP guidelines, each individual inorganic water sample may be analyzed for total metals or dissolved metals, but not both. Therefore, water samples collected for total metal and dissolved metal analyses from the same sampling location must be assigned separate (unique) CLP Sample Numbers. A sampler can use the same CLP Sample Number for an inorganic soil or water sample collected for total metals, mercury and cyanide analyses.

Organic soil and water samples may be collected for analysis under the SOM01 SOW to detect:

- Aroclors;
- Semivolatile Organic Analytes (SVOAs);
- Pesticides;
- Volatile Organic Analytes (VOAs); and/or
- Trace Volatile Analytes

Inorganic soil and water samples may be collected for analysis for cyanide, and for metals using Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES) and Cold Vapor Atomic Absorption (CVAA), under the ILM05.X SOW.

Inorganic water only samples may be collected for analysis for cyanide, and for metals using Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) and CVAA, under the ILM05 SOW.

2.4.2 Prepare Sample Cooler Return Documentation

CLP laboratories must routinely return sample shipping coolers to the appropriate sampling office within 14 calendar days following receipt of shipment from the sampler. For sample coolers to be returned, the sampler must complete the appropriate cooler documentation and work with Regions and government agencies to provide a cost-effective mechanism for laboratories to return the empty coolers to the appropriate sampling office. The sampling cooler return documentation can be prepared in advance and provided to samplers before field activities begin. **The sampler (not the CLP laboratory) is responsible for paying for return of the cooler and should also include shipping airbills bearing the sampler's account number, as well as a return address to allow for cooler return.**

To maintain consistency among cooler transportation programs, samplers should:

- Minimize the use of multiple transportation carriers to avoid confusion;
- Use multiple-copy labels so the laboratory and the sampling team can each retain a copy for their records;
- Prepare labels in advance so that the laboratory can simply affix a completed shipping label on the cooler;
- Include third-party billing information (i.e., their shipping account number) on labels so the laboratory will not be billed by the transportation carrier;
- Confirm that the laboratory knows which transportation carrier to use; and
- Include the SMO-assigned Case Number on return information.

2.5 Obtain Municipal Permits, Licenses, and Clearances

At-a-Glance:
Obtain permits, licenses, and clearances.

- ✓ Request access to County, State, Tribal, military, and/or Federal property.
- ✓ Contact private property owner(s).
- ✓ Contact utility companies.

Before starting a sampling event, samplers must make sure to obtain the proper municipal permits, accesses to the property, and any government clearances, if required. The sampler must also contact any appropriate utility companies to ascertain where any underground pipes, cables, etc., may be located.

2.5.1 Request Access to County, State, Tribal, Military, and/or Federal Property

Proper access to perform sampling activities is important not only for legal reasons, but also to eliminate delays in work and possible refusal to allow sampling to take place. It is crucial that the appropriate permits, licenses, and clearances be secured to obtain access for sampling activities that will be performed on County, State, Tribal, military, and/or Federal property. The sampler must contact the appropriate government offices or personnel well in advance to determine what kinds of approval are required. Pre-approval may be required for specific types of sample collection such as drilling or excavation. For example, drilling on a military base requires pre-approval. Base security may require clearances for all members of the sampling team, including subcontractors. This process may take two or more days.

If arrangements are not made in advance, the team may not be allowed to enter the site until their clearances are processed and the team has been approved to drill. As a result, the sampling schedule is delayed, costing extra time and money.

2.5.2 Contact Private Property Owners

The sampler must obtain written permission from the private property owner(s) before sampling on their property, even if verbal permission has been granted. It is recommended that samplers obtain verbal permission prior to their arrival at the sampling location, but written permission can be obtained on the day of sampling. If a property owner refuses to grant access to their property, it may be necessary for sampling participants to contact the appropriate authorities for assistance.

2.5.3 Contact Utility Companies

The sampler should contact local utility companies (e.g., power, phone, gas, cable, sanitation, etc.) at least one week prior to the sampling event to have underground cables, lines, and pipes flagged and marked. This is required by law. A national one-call directory can be found at:

http://www.digsafely.com/contacts.htm.

This will eliminate potential safety hazards and service disruption. For example, soil sampling in a residential area may require digging below the soil's surface. It is very important to know where utility lines and pipes are located so that samplers do not hit live electrical wires or rupture gas lines. Samplers should follow Regional or other appropriate program procedures for the procurement of such services. The utility service(s) disruption dates should be confirmed at least two days prior to sampling activities.

Note: Pre-payment of survey fees to local utility companies may be required.

2.6 Identify and Obtain Sampling Materials

At-a-Glance:
Identify and obtain sampling materials.

- ✓ Procure appropriate equipment and supplies.
- ✓ Procure sample containers.
- ✓ Procure shipping supplies.

Samplers must make sure to be prepared for a sampling project with the appropriate sampling materials (equipment, supplies, sample containers, packing materials, and shipping materials). The equipment and supplies must be properly cleaned, calibrated, and tested as necessary to meet the needs of the sampling project.

2.6.1 Procure Appropriate Equipment and Supplies

Each sampling event requires the procurement of equipment and materials to collect, document, identify, pack, and ship samples. The proper field sampling equipment is vital to a successful sample collection. Regional or other samplers should obtain, and arrange in advance, all of the equipment and supplies required for each sampling event. Samplers should review the project plans to verify that the proper equipment is being used for sample collection.

At a minimum, the following materials are generally required during a sampling event:

- Sample storage containers;
- Packing material;
- Sample containers;
- Shipping containers;
- Access to the FORMS II Lite software for creating sample labels, stickers, tags, and TR/COC Records;
- Custody seals; and
- Sampling equipment such as bowls, augers, pumps, etc.

Sampling events may also require specific items such as:

- Cooler temperature blanks;
- Trip blanks for VOA analysis;
- Preservation supplies (e.g., ice or acid); and
- Specially prepared sample vials (e.g., for SW-846 Method 5035A).

2.6.2 Procure Sample Containers

The analytical protocol(s) to be used for sample analysis often requires the use of a particular type of sample container. The type of container also may depend on the sample matrix and analysis. It is recommended that samplers use borosilicate glass containers, which are inert to most materials, when sampling for pesticides and/or other organics. Conventional polyethylene is recommended when sampling for metals because of the lower cost and absorption rate of metal ions.

Using the wrong container may result in breakage, gathering of an insufficient volume needed to perform sample analysis, or the container material may interfere with the analysis. Therefore, samplers should identify and use the correct sample containers for each sampling event.

Containers procured for a sampling event are usually pre-cleaned and shipped ready-for-use from the manufacturer to the sampling site. Regardless of the type of container used, samplers must ensure that the containers have been analyzed or certified clean to levels below concern for the project. These containers must meet the USEPA container type specifications listed in Table 2-2.

Table 2-2. Container Type Specifications

Reference Number	Container Type	Specifications	
		Closure	Septum
1	40 mL amber glass vial, 24 mm neck finish.	Polypropylene or phenolic, open-top screw-cap, 15 cm opening, 24-400 size.	24 mm disc of 0.005 in. Polytetrafluoroethylene (PTFE) bonded to 0.120 in. silicone for total a thickness of 0.125 in.
2	1 L high density polyethylene, cylinder-round bottle, 28 mm neck finish.	Polyethylene cap, ribbed, 28-410 size; F217 polyethylene liner.	N/A
3	8 oz short, wide mouth, straight-sided, glass jar, 70 mm neck finish.	Polypropylene or phenolic cap, 70-400 size; 0.015 in. PTFE liner.	N/A
4	4 oz (120 mL) tall, wide mouth, straight-sided, glass jar, 48 mm neck finish.	Polypropylene or phenolic cap, 48-400 size; 0.015 in. PTFE liner.	N/A
5	1 L amber round glass bottle, 33 mm pour-out neck finish.	Polypropylene or phenolic cap, 33-430 size; 0.015 in. PTFE liner.	N/A
6	500 mL high density polyethylene, cylinder-round bottle, 28 mm neck finish.	Polypropylene cap, ribbed, 28-410 size; F217 polyethylene liner.	N/A
7	Coring tool used as a transport device (e.g., 5 g Sampler).	Has built-in closing mechanism.	N/A
8	250 mL high density polyethylene, cylinder-round bottle, 28 mm neck finish.		N/A

The information contained in this table is also cross-referenced in the sample collection parameters discussed in Chapter 3. The container Reference Numbers are used in Tables 3-2 and 3-3 under the Containers column. For example, samples collected for low-level soil VOA analysis using SW-846 Method 5035A may require the sampler to use pre-prepared, tared closed-system purge-and-trap vials with a preservative (refer to Appendix B).

Note: Have extra containers readily available for each sampling event in case of breakage, loss, or *contamination.*

2.6.3 Procure Shipping Supplies

Samples should be correctly packaged into the appropriate shipping containers to reduce the risk of breakage or leakage, and the shipping containers should be appropriately prepared for shipment. Before heading into the field, samplers should refer to the appropriate project plans to determine the types of samples that will be taken during the sampling project so that samplers will have the proper packaging materials at the site for all pertinent samples container types and sample matrices. Samplers should also make sure to obtain the appropriate shipping paperwork (e.g., shipping forms required by the delivery service).

2.7 Comply with Transportation and Shipping Requirements

Samplers are expected to review the applicable project plans to be aware of all State, Federal, Department of Transportation (DOT), and International Air Transport Association (IATA) regulations governing environmental and hazardous sample packaging. The person who ships the samples is responsible for being in compliance with applicable packaging, labeling, and shipping requirements.

Samplers should request and receive sample permits for outside the continental United States, prior to shipping.

Additional information can be obtained on Hazardous Materials Safety Program regulations from the DOT's Research and Special Programs Administration. Federal transportation regulations can be found in 49-CFR Parts 100-185, are available on the Internet at:

http://www.myregs.com/dotrspa/

2.8 Provide Shipment Notification

Some Regions may require that samplers notify their RSCC (or his/her designee) when samples are shipped. Some Regions allow samplers to contact SMO directly to provide shipment notification. It is recommended that samplers contact the RSCC of sample origin to verify if such notification is necessary. If samplers are shipping samples after 5:00 PM ET, samplers must notify the RSCC (or designee) or SMO by 8:00 AM ET on the following business day.

For Saturday delivery at the laboratory, samplers MUST contact the RSCC (or designee) or SMO so that SMO will receive the delivery information by 3:00 PM ET on the Friday prior to delivery.

2.9 Perform Readiness Review/Dry Run

A readiness review/dry run is a test run of the proposed sampling event. This is a recommended practice since it gives samplers a chance to check all plans, documentation software (i.e., FORMS II Lite), and equipment lists for accuracy and completeness prior to sampling activities. It also provides an opportunity to consult with sampling team members to make sure all the elements are in place and everyone understands their tasking before actually going out to the field. Sampling project managers should provide the test or dry run dates and schedules to samplers so that samplers can prepare accordingly.

3.0 IN-FIELD ACTIVITIES

This chapter addresses the in-field activities a sampler will focus on during a sampling event such as: determining the type of samples to be collected; collecting the samples; meeting volume, preservation, and holding time requirements; completing documentation; and packing and shipping samples.

At-a-Glance: In-field Activities

- ✓ Collecting samples
- ✓ Completing documentation
- ✓ Sampling considerations
- ✓ Procuring shipping supplies

When performing a sampling event, the sampler is expected to follow prescribed sampling techniques. The sampler should also be aware of any special sampling considerations, contamination issues, and sample compositing and mixing methods that could affect their sampling efforts. Please refer to Appendix D for more detailed information.

Note: Appropriate Regional guidance and procedures should be consulted for detailed sample collection, preservation, handling and storing, equipment decontamination, and QA/QC procedures.

3.1 Collect Samples

CLP RAS are generally used to analyze samples from Superfund sites. The matrices can be water, soil, or sediment. In some instances, a mixed-matrix sample may be collected which contains either a supernate (for a sediment/soil sample) or a precipitate (for a water sample). In this event, samplers should consult their management plans and/or discuss the required procedures with the RSM or their designee.

A CLP sample consists of all sample aliquots (portions):

- for each individual or set of analytical fractions;
- from one station location;
- for one sample matrix;
- at one concentration level;
- for one laboratory; and
- for one analytical program;

provided that the fractions are all requested from the same CLP analytical service.

In general, it is recommended that two individual samples be collected by separating the aqueous layer from the solid/precipitate layer at the point of collection. They may be assigned two different sample IDs (e.g., Sample IDs ABC124 and ABC125 for Sample ID ABC123), along with a note in the field sample log or tracking system that the sample IDs are derived or related to the same sample ID, to ensure correct follow-up upon receipt of results from the laboratory. Alternatively, they may be assigned the same sample ID, along with a notation of each individual sub-sample or fraction (e.g., Sample IDs ABC123-1 and ABC123-2 or Sample ID ABC123 Fraction 1 and Sample ID ABC123 Fraction 2 for Sample ID ABC123).

3.1.1 Determine Types of Samples to be Collected

Samplers may be required to take several types of samples or sample aliquots during a sampling event. They should refer to their project plans to determine the types of samples or aliquots to be taken, the volumes needed of each sample or aliquot, and the preservation needed for each sample. For an explanation of the various sample types and the requirements for collecting and submitting each particular type, refer to Table 3-1.

Table 3-1. QC Sample Types and CLP Submission Requirements

Sample Type	Purpose	Collection[1]	CLP Sample Number
Field Duplicate	To check reproducibility of laboratory and field procedures. To indicate non-homogeneity.	Collect from areas that are known or suspected to be contaminated. Collect one sample per week or 10% (Regions may vary) of all field samples per matrix, whichever is greater.	Assign two separate (unique) CLP Sample Numbers (i.e., one number to the field sample and one to the duplicate). Submit blind to the laboratory.
Field Blanks	To check cross-contamination during sample collection, preservation, and shipment, as well as in the laboratory. Also to check sample containers and preservatives.	Collect for each group of samples of similar matrix per day of sampling. Organics - Use water (demonstrated to be free of the contaminants of concern). Inorganics - Use metal-free (deionized or distilled) water.	Assign separate CLP Sample Numbers to the field blanks.
Trip Blank (Volatile Organic Analysis Only)	To check contamination of VOA samples during handling, storage, and shipment from field to laboratory.	Prior to going into the field, prepare and seal one sample per shipment per matrix using water demonstrated to be free of the contaminants of concern (deionized water is appropriate). Place this sample in the cooler used to ship VOA samples.	Assign separate CLP Sample Numbers to the trip blanks.
Equipment Blank or Rinsate Blank	To check field decontamination procedures.	Collect when sampling equipment is decontaminated and reused in the field or when a sample collection vessel (bailer or beaker) will be used. Use blank water (water demonstrated to be organic-free, deionized or distilled for inorganics) to rinse water into the sample containers.	Assign separate CLP Sample Numbers to the equipment blanks.
Matrix Spike (MS) and Duplicate (MSD)[2] (Organic Analysis Only)	To check accuracy and precision of organic analyses in specific sample matrices.	Collect from areas that are known or suspected to be contaminated. For smaller sampling events (i.e., 20 samples or less), MS/MSD additional volume should be collected in the first round of sampling and included in the first shipment of samples to the laboratory. Collect double or triple volume[3] for aqueous samples and soil VOA samples designated for MS/MSD analyses. Additional sample volume is not required for soil samples requiring SVOA, Pesticide, and/or Aroclor analysis. See Appendix B for VOA collection volumes.	Assign the same CLP Sample Number to the field sample and the extra volume for MS/MSD. Identify the sample designated for MS/MSD on the TR/COC Record.
Matrix Spike (MS) and Duplicate (MSD) (Inorganic Analysis Only)	To check accuracy and precision of inorganic analyses in specific sample matrices.	Collect from areas that are known or suspected to be contaminated. For smaller sampling events (i.e., 20 samples or less), Matrix Spike and Duplicates should be collected in the first round of sampling and included in the first shipment of samples to the laboratory. Additional sample volume may be required for inorganic analysis.[4]	Assign the same CLP Sample Number to the field sample and extra volume (if collected). Identify the sample(s) designated for Matrix Spike and Duplicates on the TR/COC Record.
PE Samples	Specially-prepared QC samples used to evaluate a laboratory's analytical proficiency.	The PE samples contain analytes with concentrations unknown to the laboratory. Designated Regional or authorized personnel (depending on Regional policy) arrange for Case-specific CLP PE samples to be prepared and shipped by the QATS contractor. The PE samples can be shipped to the site, or shipped per Regional direction. QATS provides the appropriate preparation instructions and chain-of-custody materials.	Samplers have no direct interaction with the PE sampling process, but should be aware that such samples do exist within the CLP sampling process. Samplers must, however, order PE samples and ship them to the laboratory if required by the Region.

[1] Consult Regional or Project Manager Guidance for field QC sample frequencies; laboratory QC sample frequencies are generally fixed in the laboratory subcontracts or specified in analytical methods. Current frequency for MS/MSD (organic) and MS/duplicate (inorganic) for the CLP is one sample per twenty field sample of similar matrix.

[2] Samples sent under the Organic SOW (SOM01) do not require an MS or MSD for Trace VOA, VOA and BNA fractions, but the Region may opt to send them at their discretion.

[3] Example of double volume: An aqueous sample for SVOA analysis would require the field sampler to collect at least 2 L of field sample and at least 1 L each for the MS and MSD samples for a total volume of 4 L. If Pesticide or Aroclor MS/MSD analyses are required for the same sample, an additional 4 L must be collected. Double volume is the MINIMUM allowable volume for samples designated for MS/MSD analysis. Triple volume may be sent for MS/MSD samples to allow for sufficient volume for these analyses in the event sample volume is lost as a result of samples breaking, leaking, or laboratory accidents.

[4] Double volume may be sent for inorganic aqueous MS and MSD samples to allow for sufficient volume for these analyses in the event sample volume is lost as a result of samples breaking, leaking or laboratory accidents.

3.1.1.1 Collect Field QC Samples

Samplers can collect field QC samples and laboratory QC samples to verify that sample quality is maintained during a sampling project.

Field QC samples are designed to assess variability of the media being sampled and to detect contamination and sampling error in the field. The types of field QC samples that are generally collected include field duplicates and field blanks (such as equipment, trip, or rinse blanks). Generally, field duplicate samples should remain "blind" to the laboratory (i.e., they should have separate CLP Sample Numbers).

3.1.1.2 Collect Laboratory QC Samples

A laboratory QC sample is an additional analysis of a field sample, as required by the laboratory's contract. There are three types of laboratory QC samples:

- MS [for organic and inorganic samples];
- MSD [for organic samples only]; and
- Duplicates [for inorganic samples only].

Note: Samplers should obtain Regional guidance regarding the collection of MS and MSD samples (especially for organics analyses).

Samplers should select one sample per matrix per 20 samples as a "laboratory QC" sample. Designated organic laboratory QC samples should be noted on the Organic TR/COC Record. Designated inorganic laboratory QC samples should be noted on the Inorganic TR/COC Record. The laboratory QC sample must not be designated only in the "Field QC Qualifier" column on either the Organic or Inorganic TR/COC Records. Make sure that the laboratory QC sample is included in TR/COC Record samples to be used for the Laboratory QC field.

The sampler should select a field sample as the laboratory QC sample. If the sampler does not select a field sample as the laboratory QC sample, then it is possible that the laboratory could select the field blank (e.g., an equipment or rinsate blank) sample to meet contractual QC requirements. The use of field blanks for laboratory MS/MSD/Duplicate analysis reduces the usability of the data to assess data quality.

Note: In the event of multiple sample shipments during a sampling event, it is recommended that the sampler submit laboratory QC samples in the first sample shipment.

3.1.2 Meet Volume, Preservation, and Holding Time Requirements

Samplers should refer to their project plans to obtain the specific sample volumes to be collected, the preservation needed for those samples, and the technical holding times under which they must submit samples to the scheduled CLP laboratory. Sample collection parameters (to include sample volumes, preservatives, and technical holding times) for organic collection and analysis are listed in Tables 3-2 and 3-3. Sample collection parameters for inorganic analysis and collection are listed in Table 3-4.

3.1.2.1 Collect Sample Volume

Collecting sufficient sample volume is critical. There must be sufficient physical sample volume for the analysis of all required parameters and completion of all QC determinations. The type of analytical procedure(s) to be performed will often dictate the sample volume to collect. For example, each water sample collected for VOA analysis by CLP SOW SOM01 or ILM05 requires a minimum of three vials, each filled completely to a 40 mL capacity. See Appendix C for information regarding the collection of VOAs in water. It is extremely important that samplers refer to their specific project plans to identify and collect the correct sample volume during each sampling event.

When sampling for VOAs in soils, samplers must use SW-846 Method 5035A guidelines included in Appendix B.

3.1.2.2 Preserve Samples

Degradation of some contaminants may occur naturally (e.g., VOAs). The sampler must chemically preserve some water samples for certain analytes before shipping them to the laboratory. The sampler should preserve and immediately cool all samples to 4°C (±2°C) upon collection and samples should remain cooled until the time of analysis (do not freeze water samples). Preservation techniques vary among Regions so the sampler should obtain Region-specific instructions and review the appropriate project plans and SOPs. See Appendix C for information regarding the collection of VOAs in water.

3.1.2.3 Ship within Holding Times

Samplers should ship samples to scheduled CLP laboratories as soon as possible after collection. Daily shipment of samples to CLP laboratories is preferred whenever possible. If samples cannot be shipped on a daily basis, they must be properly preserved and maintained to meet CLP-specified temperatures, holding times, and custody requirements.

The technical holding times are the maximum time allowed between a sample collection and the completion of the sample extraction and/or analysis. In contrast, contractual holding times are the maximum lengths of time that the CLP laboratory can hold the sample prior to extraction and/or analysis. These contractual holding times are described in the appropriate CLP SOW. Contractual holding times are shorter than the technical holding times to allow for sample packing and shipping.

Note: If samplers are shipping samples after 5:00 PM ET, they must notify the RSCC (or designee) or SMO by 8:00 AM ET on the following business day. When making a Saturday delivery, samplers shall contact the RSCC (or designee) or SMO by 3:00 PM ET on the Friday prior to delivery.

Table 3-2. Sample Collection Requirements for CLP SOW SOM01 (VOAs)

Matrix	Container Type	Sample Type	Minimum Number of Containers Needed				Minimum Volume/ Mass	Important Notes	Preservative	Technical Holding Time
			with Water	Dry	% Moisture	TOTAL				
Water	See Table 2-2, Reference Number 1.	Samples Only	-	-	-	3	Fill to capacity	Containers/vials must be filled to capacity with no headspace or air bubbles. Refer to Appendix C for samples requiring QC analyses.	Preserve to a pH of 2 with HCl and cool to 4°C (±2°C) immediately after collection. DO NOT FREEZE water samples.	14 days
		Samples with SIM	-	-	-	4				
		Samples with MS/MSD	-	-	-	6				
		Samples with SIM and MS/MSD	-	-	-	8				
Soil/ Sediment	**OPTION 1** Closed-system Vials See Table 2-2, Reference Number 1.	Samples Only	-	3	1	4	5g	Place samples on side prior to being frozen. Refer to Appendix B for samples requiring QC analyses.	Frozen (-7°C to -15°C) or iced to 4° (±2°C).	14 days
		Samples with MS/MSD	-	9	1	10				48 hours
	OPTION 2 Closed-system Vials containing Water See Table 2-2, Reference Number 1.	Samples Only	2	1	1	4	5g	Containers/vials must be filled to capacity with no headspace or air bubbles. Place samples on side prior to being frozen. Refer to Appendix B for samples requiring QC analyses.	Frozen (-7°C to -15°C) or iced to 4° (±2°C). DO NOT FREEZE water samples.	14 days
		Samples with MS/MSD	6	1	5	12				48 hours
	OPTION 3 See Table 2-2, Reference Number 7.	Samples Only	-	3	1	4	5g	Refer to Appendix B for samples requiring QC analysis.	Frozen (-7°C to -15°C) or iced to 4°C (±2°C).	48 hours
		Samples with MS/MSD	-	9	1	10				48 hours

Notes

1 Minimum volume/mass to be collected in order to ensure sample analysis can be performed.

2 Check Regional guidance regarding use of acid as a preservative of samples that may contain carbonates, residual chlorine, and other oxidants.

3 This technical holding time is calculated from the time of sample collection to sample extraction. Sample extracts are to be analyzed within 40 days of extraction. It is recommended that samplers ship samples to the laboratory on the same day that they are collected, or as soon as possible thereafter.

4 Check Regional guidance regarding use of acid preservatives when testing for carbonates, residual chlorine, and other oxidants.

Table 3-3. Sample Collection Requirements for CLP SOW SOM01 (SVOAs, Pesticides and Aroclors)

Analysis	Matrix	Containers	Minimum Volume/ Mass	Important Notes	Preservative	Technical Holding Time
Semivolatile Analytes	Water	See Table 2-2, Reference Number 5.	2L	If amber containers are not available, the samples should be protected from light.	Cool all samples to 4°C (±2°C) immediately after collection. DO NOT FREEZE water samples.	7 days
	Soil/ Sediment	See Table 2-2, Reference Numbers 3 and 4.	Fill to capacity		Cool all samples to 4°C (±2°C) immediately after collection.	14 days
Pesticides/ Aroclors	Water	See Table 2-2, Reference Number 5.	2L	If amber containers are not available, the samples should be protected from light.	Cool all samples to 4°C (±2°C) immediately after collection. DO NOT FREEZE water samples.	7 days
	Soil/ Sediment	See Table 2-2, Reference Numbers 3 and 4.	Fill to capacity		Cool all samples to 4°C (±2°C) immediately after collection.	14 days

Notes

[1] Minimum volume/mass to be collected in order to ensure sample analysis can be performed.

[2] Check Regional guidance regarding use of acid as a preservative of samples that may contain carbonates, residual chlorine, and other oxidants.

[3] This technical holding time is calculated from the time of sample collection to sample extraction. Sample extracts are to be analyzed within 40 days of extraction. It is recommended that samplers ship samples to the laboratory on the same day that they are collected, or as soon as possible thereafter.

[4] Check Regional guidance regarding use of acid preservatives when testing for carbonates, residual chlorine, and other oxidants.

Table 3-4. Sample Collection Requirements for CLP SOW ILM05

Analysis	Matrix	Containers	Minimum Volume/ Mass[1]	Important Notes	Preservative	Technical Holding Time[4]
Metals/ICP-AES and/or Mercury by CVAA	Water	See Table 2-2, Reference Number 2.	1L	If collecting for both ICP-AES AND ICP-MS methods, a separate 1L volume of sample must be collected for each method per sample location.	Acidify to pH < 2 with HNO_3 and cool to 4°C (±2°C) immediately after collection.[2] DO NOT FREEZE water samples.	6 months for all metals except Mercury (28 days)
	Soil/ Sediment	See Table 2-2, Reference Number 3.	Fill to capacity		Cool to 4°C (±2°C) immediately after collection.	6 months
Cyanide/ Spectrophotometric Determination[3]	Water	See Table 2-2, Reference Number 2.	1L		To neutralize residual chlorine, immediately upon collection, add 0.6 g ascorbic acid for each liter of sample collected. Add NaOH until pH >12 and cool to 4°C (±2°C) immediately after collection.[5] DO NOT FREEZE water samples.	14 days
	Soil/ Sediment	See Table 2-2, Reference Number 3.	Fill to capacity		Cool to 4°C (±2°C) immediately after collection.	14 days

Notes

1 Minimum volume/mass to be collected in order to ensure sample analysis can be performed.

2 Check Regional guidance regarding use of acid as a preservative of samples that may contain carbonates, residual chlorine, and other oxidants.

3 Samplers must test for sulfide and oxidizing agents (e.g., chlorine) in aqueous samples in the field upon collection. Please refer to the SAP and Appendix C for guidance. Sulfides adversely affect the analytical procedure. The following can be done to test for and neutralize sulfides. Place a drop of the sample on lead acetate test paper to detect the presence of sulfides. If sulfides are present, treat 25 mL more of the sample than that required for the cyanide determination with powdered cadmium carbonate or lead carbonate. Yellow cadmium sulfide or black lead sulfide precipitates if the sample contains sulfide. Repeat this operation until a drop of the treated sample solution does not darken the lead acetate test paper. Filter the solution through a dry filter paper into a dry beaker, and from the filtrate measure the sample to be used for analysis. Avoid a large excess of cadmium carbonate and a long contact time in order to minimize a loss by complication or occlusion of cyanide on the precipitated material. Sulfide removal should be performed in the field, if practical, prior to pH adjustment with NaOH.

4 This technical holding time is calculated from the time of sample collection to sample extraction. Sample extracts are to be analyzed within 40 days of extraction. It is recommended that samplers ship samples to the laboratory on the same day that they are collected, or as soon as possible thereafter.

3.2 Complete Documentation

Samplers must complete all documentation, including the recording of the CLP Sample Number on the sample container or bottle, sample labels, and chain-of-custody seals (as appropriate), the completion of the TR/COC Record, and the completion of field operations records (as necessary).

Samplers should use the FORMS II Lite software to create and print sample labels and the TR/COC Record. Samplers can create and print out two copies of a sample label and attach one to the sample container or bottle, and place the other on the sample tag that may be attached to the sample container or bottle.

Samplers are expected to review their project plans to determine what documentation they are expected to include during a sampling event. It is highly recommended that samplers provide documentation, even if the Region does not require it.

Note: Under no circumstances should the site name appear on any documentation being sent to the laboratory.

An example of a packaged sample is shown in Figure 3-1. A description of each type of documentation and instructions for accurate completion are included in the following sections.

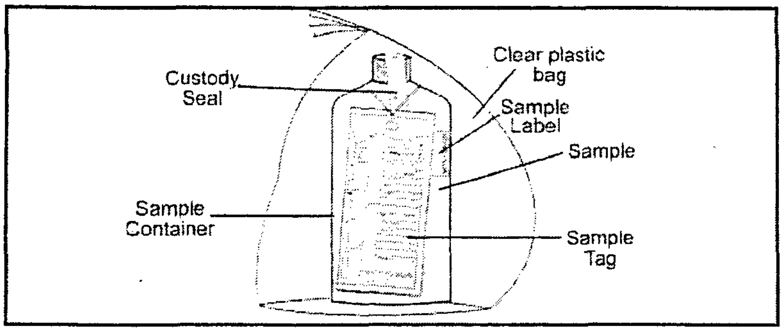

Figure 3-1. Packaged Sample with Identification and Chain-of-Custody Documentation (Excluding TR/COC Record)

3.2.1 Identify a Sample with a CLP Sample Number and SMO-assigned Case Number

The CLP Sample Number and SMO-assigned Case Number <u>must</u> be recorded on each sample taken during a sampling event (see Section 1.4.1.1). Samplers can record these numbers on the sample bottle or container using permanent ink. The numbers must also be recorded on the sample tag, if required.

Note: Dissolved metal samples and total metal samples taken from the same sampling location cannot have the same CLP Sample Number because two different sets of data will be generated.

3.2.2 Complete TR/COC Records

A Traffic Report is used as physical evidence of sample custody and as a permanent record for each sample collected. A chain-of-custody record documents the exchange and transportation of samples from the field to the laboratory.

The ASB requires samplers to use the FORMS II Lite software to create documentation for all CLP sampling efforts. For assistance with obtaining or using the FORMS II Lite software, please contact the FORMS II Lite Help Desk at 703-818-4200 from 9:00 AM - 5:00 PM ET.

To meet CLP sample documentation and chain-of-custody requirements, the sampler must attach a separate TR/COC Record to each cooler they ship. The TR/COC Record must document each sample within the cooler. Samples shipped in other coolers should not be documented. This practice maintains the chain-of-custody for all samples in case of incorrect shipment.

If more than one TR/COC Record is used for the samples within one cooler, all of the records must have complete header information and original signatures. Samplers are responsible for the care and custody of samples from the time of collection to the time of shipment to the laboratories for analysis. A sample is considered under custody if:

- It is in possession or in view after being in possession;
- It was in possession and then secured or sealed to prevent tampering; or
- It was in possession when placed in a secured area.

Each time the custody of samples is turned over to another person, the TR/COC Record must be signed off by the former custodian and accepted by the new custodian. Samplers are, therefore, responsible for properly completing any forms or other Region-required documentation used to establish the chain-of-custody for each sample during a sampling event.

3.2.2.1 Complete a TR/COC Record Using the FORMS II Lite Software

Once the sampler inputs sample collection information into FORMS II Lite, a TR/COC Record will be generated electronically. The software automatically displays only the information to be entered by the sampler. FORMS II Lite then generates a laboratory and a Regional copy of the TR/COC Record (see Figures 3-2 through 3-5). The sampler can print out multiple copies of the TR/COC Record as necessary. The sampler must sign and submit original copies of the TR/COC Record as appropriate.

An electronic TR/COC Record created using the FORMS II Lite software contains basic header information; however, the sampler can also include some additional detailed information. For example, not only is the sample matrix listed on the electronic TR/COC Record, but the name of the sampler taking the sample can also be entered. Samplers should note that certain information will not appear on the electronic TR/COC Record (e.g., matrix and preservative descriptions).

3.2.2.2 Indicate Modified Analysis on FORMS II Lite TR/COC Records

When completing a TR/COC Record using FORMS II Lite, the sampler should identify any samples that will be analyzed using a CLP Modified Analysis. Samplers should indicate use of a Modified Analysis by creating a new analysis within the FORMS II Lite Wizard or through the FORMS II Lite Reference Tables. This newly-created analysis should contain the Modification Reference Number within the name assigned to the analysis. For example, if a Region submits a Modified Analysis for an additional analyte, and SMO assigns the Modification Reference Number 1301.0, the FORMS II Lite analysis could be named "VOA by M.A. 1301.0". The associated abbreviation for this analysis could be "VOA M.A.". If you have any questions regarding identification of Modified Analysis using FORMS II Lite, please contact the FORMS II Lite Help Desk at 703-818-4200 from 9:00 AM - 5:00 PM ET.

3.2.2.3 Make Manual Edits to Printed FORMS II Lite TR/COC Records

If a FORMS II Lite TR/COC Record has been printed and deletions or edits need to be made by the sampler, the following procedures must be followed:

- If making a deletion, manually cross out the information to be disregarded from the TR/COC Record, initial and date the deletion.
- If making an addition, enter the new information and initialsign and date the newly added information.

Note: All modifications made on a printed TR/COC Record must be initialed and dated.

EPA **USEPA Contract Laboratory Program**
Organic Traffic Report & Chain of Custody Record

Case No: 39400
DAS No: DAS9000
SDG No:
L

Date Shipped:	2/20/2001
Carrier Name:	DHL
Airbill:	121212
Shipped to:	Organic Laboratory 1234 Smith Drive Anywhere, USA 12345 (123) 456-7890

Chain of Custody Record

Sampler Signature:

	Relinquished By	(Date / Time)	Received By	(Date / Time)
1				
2				
3				
4				

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

ORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		INORGANIC SAMPLE No.	FOR LAB USE ONLY Sample Condition On Receipt
C0075	Industrial Process Wastewater/ BOBBY SAMPLER	H/C	BNA/PEST (21), VOA (21)	6486, 6487 (2)	LOCATION ONE	S: 2/20/2001 E: 2/23/2001	16:02 16:02	MC0075	
C0076	Ground Water/ JOE SAMPLER	L/C	BNA/PEST (21), VOA (21)	6494, 6495 (2)	LOCATION TWO	S: 2/20/2001 E: 2/21/2001	16:01 16:01	MC0076	
C0077	Industrial Effluent Wastewater/ JOE SAMPLER	M/G	BNA/PEST (21), VOA (21)	6502, 6503 (2)	LOCATION ONE	S: 2/16/2001 E: 2/20/2001	15:55 15:55	MC0077	

Shipment for Case Complete?	Sample(s) to be used for laboratory QC: C0077	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? ___	Shipment Iced? ___

BNA/PEST = CLP TCL Semivolatiles and Pesticides/PC, VOA = CLP TCL Volatiles

TR Number: 3-103823254-022001-0001

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office; Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

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Figure 3-2. Organic Traffic Report & Chain of Custody Record (Laboratory Copy)

EPA

USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No:	39400	L
DAS No:	DAS9000	
SDG No:		

Date Shipped:	2/20/2001
Carrier Name:	DHL
Airbill:	121212
Shipped to:	Inorganic Laboratory 1234 Smith Drive Anywhere, USA 12345 (123) 456-7890

Chain of Custody Record

Sampler Signature:

Relinquished By	(Date / Time)	Received By	(Date / Time)
1			
2			
3			
4			

For Lab Use Only

Lab Contract No: ______
Unit Price: ______
Transfer To: ______
Lab Contract No: ______
Unit Price:

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	FOR LAB USE ONLY Sample Condition On Receipt
MC0075	Industrial Process Wastewater/ BOBBY SAMPLER	H/C	Al (21), Ba (21), Ca (21), Cr (21), TM/CN (21)	6481, 6482, 6483, 6484, 6485 (5)	LOCATION ONE	S: 2/20/2001 E: 2/23/2001	16:02 16:02	C0075	
MC0076	Ground Water/ JOE SAMPLER	L/C	Al (21), Ba (21), Ca (21), Cr (21), TM/CN (21)	6489, 6490, 6491, 6492, 6493 (5)	LOCATION TWO	S: 2/20/2001 E: 2/21/2001	16:01 16:01	C0076	
MC0077	Industrial Effluent Wastewater/ JOE SAMPLER	M/G	Al (21), Ba (21), Ca (21), Cr (21), TM/CN (21)	6497, 6498, 6499, 6500, 6501 (5)	LOCATION ONE	S: 2/16/2001 E: 2/20/2001	15:55 15:55	C0077	

Shipment for Case Complete?N	Sample(s) to be used for laboratory QC: MC0077	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? __	Shipment Iced? __

Al = Aluminum, Ba = Barium, Ca = Calcium, Cr = Chromium, TM/CN = CLP TAL Total Metals and Cyanide

TR Number: 3-103823254-022001-0003

LABORATORY COPY

PR provides preliminary results.. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

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Figure 3-3. Inorganic Traffic Report & Chain of Custody Record (Laboratory Copy)

USEPA Contract Laboratory Program
Organic Traffic Report & Chain of Custody Record

Case No: 39400
DAS No: DAS9000
R

Region:	3
Project Code:	QW-123
Account Code:	ACCT000
CERCLIS ID:	
Spill ID:	ID3
Site Name/State:	REAL SITE, UT
Project Leader:	DAN SAMPLER
Action:	Other
Sampling Co:	SMITH CO

Date Shipped:	2/20/2001
Carrier Name:	DHL
Airbill:	121212
Shipped to:	Organic Laboratory 1234 Smith Drive Anywhere, USA 12345 (123) 456-7890

Chain of Custody Record | Sampler Signature:

Relinquished By (Date / Time)	Received By (Date / Time)
1	
2	
3	
4	

ORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME	INORGANIC SAMPLE No.	QC Type
C0075	Industrial Process Wastewater/ BOBBY SAMPLER	H/C	BNA/PEST (21), VOA (21)	6486, 6487 (2)	LOCATION ONE	S: 2/20/2001 16:02 E: 2/23/2001 16:02	MC0075	--
C0076	Ground Water/ JOE SAMPLER	L/C	BNA/PEST (21), VOA (21)	6494, 6495 (2)	LOCATION TWO	S: 2/20/2001 16:01 E: 2/21/2001 16:01	MC0076	Spike
C0077	Industrial Effluent Wastewater/ JOE SAMPLER	M/G	BNA/PEST (21), VOA (21)	6502, 6503 (2)	LOCATION ONE	S: 2/16/2001 15:55 E: 2/20/2001 15:55	MC0077	--

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC: C0077	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced?

BNA/PEST = CLP TCL Semivolatiles and Pesticides/PC, VOA = CLP TCL Volatiles

TR Number: 3-103823254-022001-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to. Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

REGION COPY

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Figure 3-4. Organic Traffic Report & Chain of Custody Record (Region Copy)

USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: Y6767 R
DAS No: DAS9000

Region:	3
Project Code:	QW-123
Account Code:	ACCT000
CERCLIS ID:	
Spill ID:	ID3
Site Name/State:	REAL SITE, UT
Project Leader:	DAN SAMPLER
Action:	Other
Sampling Co:	SMITH CO.

Date Shipped:	2/20/2001
Carrier Name:	DHL
Airbill:	121212
Shipped to:	Clayton Environmental Consultants, Inc 22345 Roethel Drive Novi MI 48375 (248) 344-1770

Chain of Custody Record

Sampler Signature:

Relinquished By	(Date / Time)	Received By	(Date / Time)
1			
2			
3			
4			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC0075	Industrial Process Wastewater/ BOBBY SAMPLER	H/C	Al (21), Ba (21), Ca (21), Cr (21), TM/CN (21)	6481, 6492, 6483, 6484, 6485 (5)	LOCATION ONE	S: 2/20/2001 E: 2/23/2001	16:02 16:02	C0075	--
MC0076	Ground Water/ JOE SAMPLER	L/C	Al (21), Ba (21), Ca (21), Cr (21), TM/CN (21)	6489, 6490, 6491, 6492, 6493 (5)	LOCATION TWO	S: 2/20/2001 E: 2/21/2001	16:01 16:01	C0076	Spike
MC0077	Industrial Effluent Wastewater/ JOE SAMPLER	M/G	Al (21), Ba (21), Ca (21), Cr (21), TM/CN (21)	6497, 6498, 6499, 6500, 6501 (5)	LOCATION ONE	S: 2/18/2001 E: 2/20/2001	15:55 15:55	C0077	--

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? ____

Al = Aluminum, Ba = Barium, Ca = Calcium, Cr = Chromium, TM/CN = CLP TAL Total Metals and Cyanide

TR Number: 3-103823254-022001-0003

REGION COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

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Figure 3-5. Inorganic Traffic Report & Chain of Custody Record (Region Copy)

3.2.3 Complete and Attach Custody Seals

Custody seals are usually pre-printed stickers that are signed (or initialed) and dated by the sampler after sample collection and placed on sample bottles or containers and/or shipping coolers or containers (see Figure 3-6). The custody seals document who sealed the sample container and verifies that the sample has not been tampered with. The seals must be placed such that they will break if the sample bottle or container or the shipping cooler or container is tampered with or opened after leaving custody of samplers. Custody seals can also be used to maintain custody of other items such as envelopes containing videotapes of the sample collection process.

Note: Custody seals should never be placed directly onto a coring tool used as a transport device (e.g., 5 g Sampler) or tared, 40 mL closed-system vials. The seals must be placed on the bag for the coring tool used as a transport device, or on the bag used to enclose the vials. Refer to Appendix B for details.

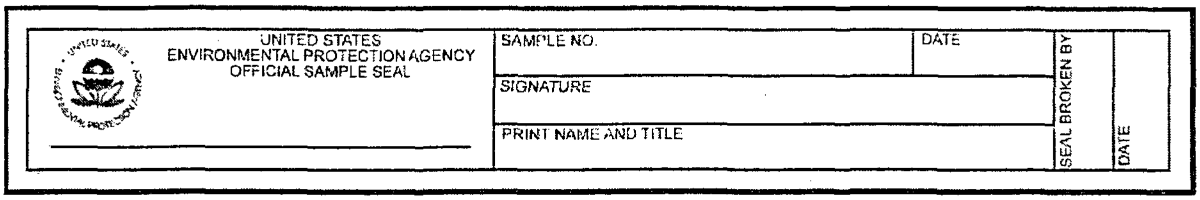
UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
OFFICIAL SAMPLE SEAL
SAMPLE NO.
DATE
SIGNATURE
PRINT NAME AND TITLE
SEAL BROKEN BY
DATE

Figure 3-6. Custody Seal

Instructions for completing and attaching a custody seal are included in Table 3-5.

Table 3-5. Completing and Attaching a Custody Seal

Step	Action	Important Notes
1	Record the CLP Sample Number.	The space for the CLP Sample Number does not need to be completed on custody seals being placed on the opening of a cooler, only on those being placed on the opening of sample bottles or containers.
2	Record the month, day, and year of sample collection.	
3	Sign the seal in the Signature field.	
4	Print your name and title in the Print Name and Title field.	
5	Place the custody seal over the edge of the sample bottle or container such that it will break if tampered with.	Custody seals can be placed directly on any sample container except for coring tools used as a transport device (e.g., 5 g Samplers) and tared VOA bottles. If packing coring tools used as a transport device or tared VOA bottles, place them in a clear plastic bag and place the custody seal on the outside of the bag.
6	If possible, cover the custody seal with clear plastic tape to protect it.	Take special care to not place the protective tape over the seal in such a way that it can be removed and then re-attached without signs of tampering.

The use and type of custody seals can vary by Region or collecting organization. Samplers should obtain the appropriate custody seals and specific instructions for correctly attaching them from the RSCC.

3.2.4 Complete and Attach Sample Labels

Samplers affix sample labels to each sample container. A sample label must contain the associated CLP Sample Number (either written or pre-printed), SMO-assigned Case Number, and the preservative used. It must also denote the analysis/fraction. Samplers may also include additional information such as the station location or the date/time of collection. Samplers should use FORMS II Lite to create and print sample labels. The sampler can print two labels and attach one to the sample container or bottle, and place the other label on the sample tag that should also be attached to the sample container or bottle. The labels should then be covered with clear packaging tape to protect the label and maintain legibility. If handwriting a sample label, the sampler should complete the label information using waterproof ink, place the label on the outside of the sample bottle or container, then cover the label with clear packaging tape to protect the label and maintain legibility (see Figure 3-1).

Do not attach labels to tared VOA sample vials. A label should already be pre-attached to the tared vial.

3.2.5 Complete and Attach Sample Tags

To support use of sample data in potential enforcement actions, sample characteristics other than on-site measurements (e.g., pH, temperature, conductivity) can be identified with a sample tag. Typically, site-specific information is written on the tags using waterproof ink. The use and type of sample tags may vary by Region. For each sampling event, samplers should receive the required sample tags and type of information to include from the RSCC. The sampler can use FORMS II Lite to create and print out multiple sample labels, one of which can be attached to the sample tag and then covered with clear packaging tape to protect the label and maintain legibility. If FORMS II Lite-created sample labels are not available, a detailed set of instructions for completing and attaching a handwritten sample tag are included in Table 3-6.

The use and type of sample tags may vary among Regions.

Table 3-6. Completing and Attaching a Handwritten Sample Tag

Step	Action	Important Notes
1	Under the "Remarks" heading, record the CLP Sample Number and SMO-assigned Case Number.	Make sure to record the correct CLP Sample Number and SMO-assigned Case Number in a legible manner.
2	Record the project code (e.g., Contract Number, Work Assignment Number, Interagency Agreement Number, etc.) assigned by USEPA.	
3	Enter the station number assigned by the sampling team coordinator.	
4	Record the month, day, and year of sample collection.	
5	Enter the military time of sample collection (e.g., 13:01 for 1:01 PM).	
6	Identify the designate and place an "X" in either the "Comp." or "Grab" box if the sample is either a composite or grab sample.	
7	Record the station location.	
8	Sign the sample tag in the Signature area.	
9	Place an "X" in the box next to Yes or No to indicate if a preservative was added to the sample.	
10	Under "Analyses", place an "X" in the box next to the parameters for which the sample is to be analyzed.	
11	Leave the box for "Laboratory Sample Number" blank.	
12	It is recommended that the sample tag be attached to the neck of the sample bottle or container using regular string, stretch string, or wire (see Figure 3-1).	Do **NOT** use wire to attach a sample tag to a metals sample.

An example of a completed sample tag is included in Figure 3-7 below:

Project Code 2	Station No. 3	Mo./Day/Year 4	Time 5	Designate: 6
06-030	1	01/10/2004	8:45 AM	Comp. / Grab x

Tag No. 3-3001

Lab. Sample No. DD001

Station Location 7

Sampler's (Signature) 8 John Smith

Remarks: 1

SVOA organics	Pesticides	VOA organics	ABN	Cyanide	Metals	Phenolics	COD, TOC, Nutrients	BOD Anions Solids (TSS) (TDS) (SS)
		x						

ANALYSES 10

Preservative: Y [x] N [ ] 9

Figure 3-7. Completed Sample Tag

3.3 Provide Sample Receipt

After samples have been taken from private property, the sampler should prepare a receipt for these samples and provide this receipt to the property owner. This is especially important when sampling on private property since these samples could be used during future litigation and the receipt will verify that the owner granted approval for the removal of the samples from the property. An example of a sample receipt created using FORMS II Lite is shown in Figure 3-8.

EPA Region 3
U.S. ENVIRONMENTAL PROTECTION AGENCY

RECEIPT FOR SAMPLES

PROJECT NO.	PROJECT NAME	NAME & LOCATION OF FACILITY/SITE
OW-123		EXAMPLE SITE
SAMPLERS: (SIGNATURES)		

STATION NO.	LOCATION/DESCRIPTION	DATE	TIME	Comp/Grab	NO. OF EPA CONTAINERS	SPLIT SAMPLE Y OR N	EPA SAMPLE TAG NO.'S
STATION ONE	LOCATION ONE	2/20/2001	15:55	G	11	Yes	112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122
STATION ONE	LOCATION TWO	2/20/2001	16:01	C	11	Yes	123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133
STATION TWO	LOCATION ONE	2/20/2001	16:02	C	11	Yes	134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144

SPLIT SAMPLES TRANSFERRED BY: (PRINT)	DATE	SPLIT SAMPLES RECEIVED BY ☐ OR DECLINED BY ☐ (PRINT)	DATE/TIME
(SIGN)	TIME	(SIGN)	TELEPHONE
		TITLE	

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Figure 3-8. Sample Receipt Created Using the FORMS II Lite Software

3.4 Pack and Ship Samples

Once the samples have been collected, it is very important that the sampler properly package the samples for shipment and ensure that the samples are sent to the appropriate laboratory as quickly as possible. Prompt and proper packaging of samples will:

- Protect the integrity of samples from changes in composition or concentration caused by bacterial growth or degradation from increased temperatures;
- Reduce the chance of leaking or breaking of sample containers that would result in loss of sample volume, loss of sample integrity, and exposure of personnel to toxic substances; and
- Help ensure compliance with shipping regulations.

3.4.1 Sample Containers

Once samples are collected, they must be stored in conditions that maintain sample integrity. All samples should be placed in shipping containers or other suitable containers with ice to reduce the temperature as soon as possible after collection. Ideally, all samples should be shipped the day of collection for overnight delivery to the laboratory. If samples cannot be shipped on the day of collection, the sample temperature should be maintained at 4°C (±2°C) until they are shipped to the laboratory.

One CLP RAS sample may be contained in several bottles and vials. For example, one soil sample may consist of all containers needed for three of the analytical fractions available under this service (i.e., SVOA fraction, Pesticide fraction, and Aroclor fraction), even though the fractions are collected in separate containers. Therefore, the analysis to be performed and the matrix type will determine the type of container(s) that will be used, as well as the volume that must be collected for that particular sample fraction.

3.4.2 Inventory of Samples and Documentation

Prior to shipment, samplers should conduct an inventory of the contents of the shipping cooler or container against the corresponding TR/COC Record when packing for shipment to laboratories. An inventory will ensure that the proper number of containers have been collected for each analysis of the samples, that the required PE and QC samples and cooler temperature blanks are included, and the correct Sample Numbers and fractions have been assigned to each sample.

3.4.3 Shipping Regulations

Sample shipping personnel are legally responsible for ensuring that the sample shipment will comply with all applicable shipping regulations. For example, hazardous material samples must be packaged, labeled, and shipped in compliance with all IATA Dangerous Goods regulations or DOT regulations and USEPA guidelines. Refer to Appendix B for detailed shipping guidelines when using SW-846 Method 5035A to preserve and ship samples.

3.4.4 Sample Packaging for Shipment

Samplers are responsible for the proper packaging of samples for shipment. To ensure that samples are appropriately packaged (e.g., to avoid breakage and/or contamination) the sampler should consult their respective project plans to determine the proper packing and shipping procedures. The sampler must determine the sample type, pack the shipping containers correctly, include necessary paperwork, label and seal shipping containers or coolers, and ship the samples.

3.4.4.1 Determine the Sample Type and Container

Samplers should know what kinds of samples they are handling to ensure proper packaging. Samplers should refer to their appropriate project plans to determine which type of sample container should be used for each type of sample being taken during the sampling event.

Please follow Regional guidance with reference to samples containing dioxin or radioactive waste.

3.4.4.2 Pack Shipping Containers

It is imperative that samples are correctly and carefully packed in shipping containers to prevent the sample containers from breaking or leaking. Samplers must prepare and pack a shipping cooler or container according to the instructions outlined in Table 3-7.

Table 3-7. Packing Samples for Shipment

Step	Action	Important Notes
1	Seal all drain holes in the shipping container, both inside and out, to prevent leakage in the event of sample breakage.	
2	Check all lids/caps to make sure the samples are tightly sealed and will not leak.	
3	Seal samples within a clear plastic bag.	Custody seals can be placed directly on any sample container except for coring tools used as a transport device (e.g., 5 g Samplers) and tared VOA bottles. If packing coring tools used as a transport device or tared VOA bottles, place them in a clear plastic bag and place the custody seal on the outside of the bag.
4	Fully chill samples to 4°C (±2°C) prior to placement within suitable packing materials.	
5	Prior to placing samples within the shipping cooler, it is recommended that samplers line shipping containers with non-combustible, absorbent packing material.	
6	Place samples in CLEAN, sealed, watertight shipping containers (metal or hard plastic coolers).	
7	Conduct an inventory of the contents of the shipping cooler/container against the corresponding TR/COC Record.	
8	Cover samples in double-bagged ice to prevent water damage to packing materials.	Do NOT pour loose ice directly into the sample cooler. The ice is used to maintain the temperature of the samples within the shipping cooler.
9	It is recommended a temperature blank be included within each cooler being shipped.	The temperature blank is generally a 40 L vial filled with water and labeled "temperature blank" but does not have a Sample Number.
10	Ensure that the site name or other site-identifying information does not appear on any documentation being sent to the laboratory.	The laboratory should not receive any site-identifying information.

3.4.4.3 Include Necessary Paperwork

Samplers must properly place the necessary paperwork in the shipping cooler. All paperwork must be placed in a plastic bag or pouch and then secured to the underside of the shipping cooler lids (see Figure 3-9).

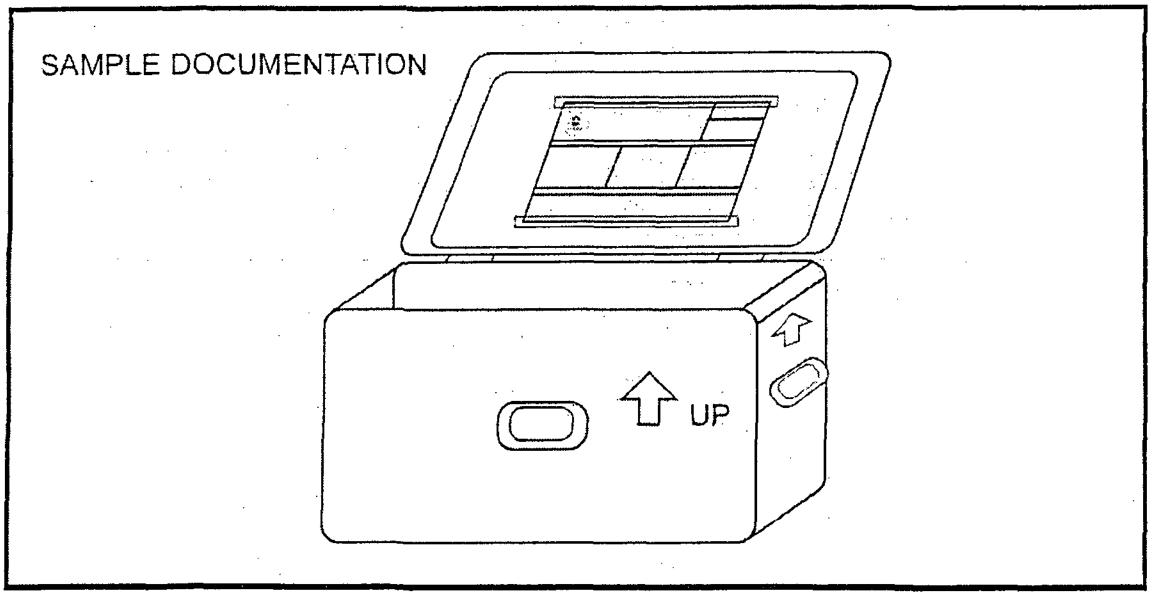

Figure 3-9. Sample Cooler with Attached TR/COC Record and Cooler Return Documentation

Necessary paperwork includes TR/COC Records and sample weight logs (see Figure 3-10), if required (for VOA samples). Samplers should contact their RSCC (or designee) for specific paperwork requirements.

USEPA Contract Laboratory Program
Sample Weight Log

Shipped to: AAA Testing Laboratory
1700 Mill Avenue
Houston TX 77099
(281) 983-1234

Case No. 39563
DAS No. DAS34
Date Shipped: 9/29/2003

Sample No.	Matrix	Analysis	Preservative	Bottle/ Tag Number	Tared Weight (g)	Final Weight (g)	Sample Weight (g)	Laboratory Weight	Traffic Report No.
C0036	Subsurface Soil (>12")	CLP TCL Volatiles	Ice Only	199540	32.80	37.20	4.40		3-103018225-092903-0001
C0036	Subsurface Soil (>12")	CLP TCL Volatiles	Ice Only	199547	32.10	38.30	6.20		3-103018225-092903-0001
C0036	Subsurface Soil (>12")	CLP TCL Volatiles	Ice Only	199549	31.20	38.60	7.40		3-103018225-092903-0001
C0037	Surface Soil (0"-12")	CLP TCL Volatiles	Ice Only	199552	32.00	36.90	4.90		3-103018225-092903-0001
C0037	Surface Soil (0"-12")	CLP TCL Volatiles	Ice Only	199551	32.40	37.10	4.70		3-103018225-092903-0001
C0037	*Surface Soil (0"-12")*	*CLP TCL Volatiles*	*Ice Only*	*199550*	*31.90*	*35.90*	*4.00*		3-103018225-092903-0001

Completed By:	Date:

All weights are measured in grams

Figure 3-10. Sample Weight Log

3.4.4.4 Return Sample Shipping Coolers

CLP laboratories must routinely return sample shipping coolers within 14 calendar days following shipment receipt. Therefore, the sampler should also include cooler return instructions with each shipment. The sampler (not the CLP laboratory) is responsible for paying for return of the cooler and should also include shipping airbills bearing the sampler's account number, as well as a return address to allow for cooler return.

3.4.4.5 Label and Seal Sample Shipping Coolers

After samples are packaged within shipping coolers, samplers must carefully secure the top and bottom of the coolers with tape, place return address labels clearly on the outside of the cooler, and attach the required chain-of-custody seals (see Figure 3-11).

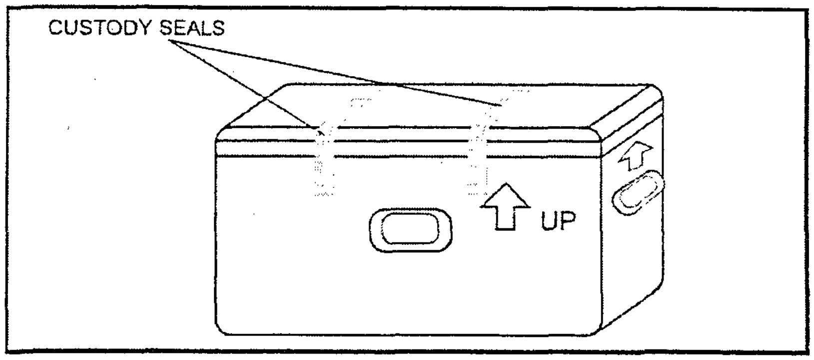

Figure 3-11. Shipping Cooler with Custody Seals

If more than one cooler is being delivered to a laboratory, samplers should mark each cooler as "1 of 2", "2 of 2", etc. In addition, samplers must accurately complete and attach shipping airbill paperwork for shipment of the samples to the laboratory. An airbill, addressed to the Sample Custodian of the receiving laboratory, should be completed for each cooler shipped. Samplers should receive the correct name, address, and telephone number of the laboratory to which they must ship samples from the RSCC or SMO. To avoid delays in analytical testing, samplers should make sure they are sending the correct types of samples to the correct laboratory when collecting samples for multiple types of analysis. For example, inorganic samples may be shipped to one laboratory for analysis, while organic samples may need to be shipped to another laboratory.

3.4.4.6 Ship Samples

The sampling contractor should ensure that samplers know the shipping company's name, address, and telephone number. In addition, they should be aware of the shipping company's hours of operation, shipping schedule, and pick-up/drop-off requirements.

Overnight Delivery

It is imperative that samples be sent via overnight delivery. Delays caused by longer shipment times may cause technical holding times to expire, which in turn may destroy sample integrity or require the recollection of samples for analysis.

Saturday Delivery

For shipping samples for Saturday delivery, the sampler MUST contact the RSCC (or their designee) or SMO so that SMO will receive the delivery information by 3:00 PM ET on the Friday prior to delivery.

3.4.5 Shipment Notification

When samples are shipped to CLP Laboratories, samplers **must immediately** report all sample shipments to the RSCC (or their designee) or to SMO. **Under no circumstances should the sampler contact the laboratory directly.** If samplers are shipping samples after 5:00 PM ET, they must notify the RSCC (or designee) or SMO by 8:00 AM ET on the following business day. Samplers should receive the name and phone number of the appropriate SMO coordinator to contact from the Region/RSCC.

Samplers must provide the following information to the RSCC (or their designee) or to SMO:

- Name and phone number at which they can easily be reached (preferably closest on-site phone number if still in the field);
- SMO-assigned Case Number (see Section 2.4.1);
- Number, concentration, matrix and analysis of samples being shipped;
- Name of laboratory (or laboratories) to which the samples were shipped;
- Airbill number(s);
- Date of shipment;
- Case status (i.e., whether or not the Case is complete);
- Problems encountered, special comments, or any unanticipated issues;
- When to expect the next anticipated shipment; and
- An electronic export of the TR/COC Record (must be sent as soon as possible after sample shipment). For information regarding electronic export of TR/COC Records, refer to the following Web site:

http://www.epa.gov/superfund/programs/clp/f2lsubmit.htm

Note: For Saturday delivery, samplers MUST contact the RSCC (or their designee) or SMO so that SMO will receive the delivery information by 3:00 PM ET on the Friday prior to delivery.

Samplers should be aware if their Region requires them to notify the RSCC (or designee) and/or SMO of sample shipment.

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Appendix A: Functions within a Sampling Project

The following table describes Quality Assurance Project Plan (QAPP) requirements taken from *EPA Requirements for Quality Assurance Project Plans* (EPA QA/R-5).

Functions Within a Sampling Project	Elements of that Function
	Project Management
Project/Task Organization	Identifies the individuals or organizations participating in the project and defines their specific roles and responsibilities.
Problem Definition/Background	States the specific problem to be solved or decision to be made and includes sufficient background information to provide a historical and scientific perspective for each particular project.
Project/Task Description	Describes the work to be performed and the schedule for implementation to include: • Measurements to be made during the course of the project; • Applicable technical, regulatory, or program-specific quality standards, criteria, or objectives; • Any special personnel and equipment requirements; assessment tools needed; and • A work schedule and any required project and quality records, including types of reports needed.
Quality Objectives and Criteria	Describes the project quality objectives and measurement performance criteria.
Special Training/Certification	Ensures that any specialized training for non-routine field sampling techniques, field analyses, laboratory analyses, or data validation should be specified.
Documents and Records	• Itemizes the information and records that must be included in the data report package and specifies the desired reporting format for hard copy and electronic forms, when used. • Identifies any other records and/or documents applicable to the project such as audit reports, interim progress reports, and final reports that will be produced. • Specifies or references all applicable requirements for the final disposition of records and documents, including location and length of retention period.
	Data Generation and Acquisition
Sampling Process Design (Experimental Design)	• Describes the experimental design or data collection design for the project. • Classifies all measurements as critical or non-critical.
Sampling Methods	• Describes the procedures for collecting samples and identifies sampling methods and equipment. Includes any implementation requirements, support facilities, sample preservation requirements, and materials needed. • Describes the process for preparing and decontaminating sampling equipment to include the disposal of decontamination by-products, selection and preparation of sample containers, sample volumes, preservation methods, and maximum holding times for sampling, preparation, and/or analysis. • Describes specific performance requirements for the method. • Addresses what to do when a failure in sampling occurs, who is responsible for corrective action, and how the effectiveness of the corrective action shall be determined and documented
Sample Handling and Custody	• Describes the requirements and provisions for sample handling and custody in the field, laboratory, and transport, taking into account the nature of the samples, the maximum allowable sample holding times before extraction and analysis, and the available shipping options and schedules. • Includes examples of sample labels, custody forms, and sample custody logs.

Analytical Methods	• Identifies the analytical methods and equipment required, including sub-sampling or extraction methods, waste disposal requirements (if any), and specific method performance requirements. • Identifies analytical methods by number, date, and regulatory citation (as appropriate). If a method allows the user to select from various options, the method citations should state exactly which options are being selected. • Addresses what to do when a failure in the analytical system occurs, who is responsible for corrective action, and how the effectiveness of the corrective action shall be determined and documented. • Specifies the laboratory turnaround time needed, if important to the project schedule. • Specifies whether a field sampling and/or laboratory analysis Case Narrative is required to provide a complete description of any difficulties encountered during sampling or analysis.
Quality Control (QC)	• Identifies required measurement QC checks for both the field and laboratory. • States the frequency of analysis for each type of QC check, and the spike compounds sources and levels. • States or references the required control limits for each QC check and corrective action required when control limits are exceeded and how the effectiveness of the corrective action shall be determined and documented. • Describes or references the procedures to be used to calculate each of the QC statistics.
Instrument/Equipment Testing, Inspection, and Maintenance	• Describes how inspections and acceptance testing of environmental sampling and measurement systems and their components will be performed and documented. Identifies and discusses the procedure by which final acceptance will be performed by independent personnel. • Describes how deficiencies are to be resolved and when re-inspection will be performed. • Describes or references how periodic preventative and corrective maintenance of measurement or test equipment shall be performed. • Identifies the equipment and/or system requiring periodic maintenance. • Discusses how the availability of spare parts identified in the operating guidance and/or design specifications of the systems will be assured and maintained.
Instrument/Equipment Calibration and Frequency	• Identifies all tools, gauges, instruments, and other sampling, measuring, and test equipment used for data collection activities affecting quality that must be controlled, and at specific times, calibrated to maintain performance within specified limits. • Identifies the certified equipment and/or standards used for calibration. • Describes or references how calibration will be conducted using certified equipment and/or standards with known valid relationships to nationally recognized performance standards. If no such standards exist, documents the basis for calibration. • Indicates how records of calibration shall be maintained and traced to the instrument.
Inspection/Acceptance of Supplies and Consumables	• Describes how and by whom supplies and consumables shall be inspected and accepted for use in the project. • States acceptance criteria for such supplies and consumables.
Non-direct Measurements	• Identifies any types of data needed for project implementation or decision-making that are obtained from non-measurement sources (e.g., computer databases, programs, literature files, historical databases). • Describes the intended use of data. • Defines the acceptance criteria for the use of such data in the project. • Specifies any limitations on the use of the data.
Data Management	• Describes the project data management scheme, tracing the data path from generation in the field or laboratory to their final use or storage. • Describes or references the standard record-keeping procedures, document control system, and the approach used for data storage and retrieval on electronic media.

Appendix B: CLP Sample Collection Guidelines for VOAs in Soil by SW-846 Method 5035A

A. Preferred Options for the Contract Laboratory Program (CLP) are Options 1, 2, and 3:

Note: Soil samples must be placed on their sides prior to being frozen.

Option 1.

Closed-system Vials:

Container - tared or preweighed 40 mL VOA Vials containing a magnetic stir bar.

Collect 5 g of soil per vial (iced or frozen in the field).

Regular Samples	3 Vials - Dry (5 g soil per vial) 1 Vial - Dry (filled with soil, no headspace) 4 Total Vials
Regular Samples Requiring QC Analysis	9 Vials - Dry (5 g soil per vial) 1 Vial - Dry (filled with soil, no headspace) 10 Total Vials

Option 2.

Closed-system Vials Containing Water:

Container - tared or pre-weighed 40 mL VOA vials containing a magnetic stir bar and 5 mL water.

Collect 5 g of soil per vial (iced or frozen in the field).

Regular Samples	2 Vials with water added (5 g soil and 5 mL water per vial) 1 Vial - Dry (5 g soil in vial) 1 Vial - Dry (filled with soil, no headspace) 4 Total Vials (2 with water and 2 dry)
Regular Samples Requiring QC Analysis	6 Vials with water added (5 g soil and 5 mL water per vial) 5 Vials - Dry (5 g soil per vial) 1 Vial - Dry (filled with soil, no headspace) 12 Total Vials (6 with water and 6 dry)

Option 3.

Coring Tool used as a Transport Device

Container - 5 g Samplers or equivalent.

Note: All Samplers should be iced or frozen in the field and bagged individually.

Regular Samples	3 Samplers (5 g soil per Sampler) 1 Vial - Dry (filled with soil, no headspace) 4 Total (3 Samplers and 1 Vial)
Regular Samples Requiring QC Analysis	9 Samplers (5 g soil per Sampler) 1 Vial - Dry (filled with soil, no headspace) 10 Total (11 Samplers and 1 Vial)

B. Options 4, 5, and 6 are NOT preferred options for the CLP:

Option 4.

Closed-system Vials:

Container - tared or preweighed 40 mL VOA Vials containing a magnetic stir bar and preservative.

Collect 5 g of soil per vial and add Sodium bisulfate ($NaHSO_4$) preservative (5 mL water + 1 g $NaHSO_4$) - iced or frozen in the field.

Caution: This option is NOT a Preferred Option for the CLP because:

NaHSO4 preservation creates low pH conditions that will cause the destruction of certain CLP target analytes (e.g., vinyl chloride, trichloroethene, trichlorofluoromethane, cis- and trans-1,3-dichloropropene). Projects requiring the quantitation of these analytes should consider alternative sample preservation methods. NaHSO4 also cannot be used on carbonaceous soils. Check the soil before using this method of collection! Soil can be checked by placing a test sample in a clean vial, then adding several drops of NaHSO4 solution. If the soil bubbles, use Option 4b and note this issue on the TR/COC Record.

Option 4a. Samples preserved in the field

Regular Samples	2 Vials with $NaHSO_4$ preservative added (5g soil per vial) 1 Vial without $NaHSO_4$ preservative added (5g soil per vial) 1 Vial - Dry (filled with soil, no headspace) 4 Total Vials (2 with $NaHSO_4$ preservative and 2 without)
Regular Samples Requiring QC Analyses	4 Vials with $NaHSO_4$ preservative added (5g soil per vial) 5 Vials without $NaHSO_4$ preservative added (5 g soil per vial) 1 Vial - Dry (filled with soil, no headspace) 10 Total Vials (4 with $NaHSO_4$ and 6 without)

Option 4b. Samples are preserved by the laboratory (No $NaHSO_4$ preservative is added to these samples in the field).

Regular Samples	3 Vials - Dry (5 g soil per vial) 1 Vial - Dry (filled with soil, no headspace) 4 Total Vials
Regular Samples Requiring QC Analyses	9 Vials - Dry (5 g soil per vial) 1 Vial - Dry (filled with soil, no headspace) 10 Total Vials

Option 5.

Methanol Preservation (medium-level analysis only):

Container - tared or pre-weighed 40 mL VOA vials containing 5-10 mL methanol.

Collect 5 g of soil per vial (iced in the field).

Caution: **This is NOT a preferred option for the CLP because:**

Samples preserved with methanol can only be analyzed by the medium-level method. Low-level Contract Required Quantitation Limit (CRQLs) cannot be achieved when samples are preserved this way.

Additional problems associated with use of methanol as a preservative in the field include:

- Possible contamination of the methanol by sampling-related activities (e.g., absorption of diesel fumes from sampling equipment);
- Leakage of methanol from the sample vials during shipping, resulting in loss of VOAs prior to analysis.

Regular Samples	2 Vials (5 g soil and 5-10 mL methanol per vial) 1 Vial - Dry (filled with soil, no headspace) 3 Total Vials (2 with methanol and 1 dry)
Regular Samples Requiring QC Analysis	6 Vials (5 g soil and 5-10 mL methanol per vial) 1 Vial -Dry (filled with soil, no headspace) 7 Total Vials (6 with methanol and 1 dry)

Note: If shipping samples containing methanol as a preservative, a shipping label must be used to indicate methanol. This label must also contain the United Nations (UN) identification number for methanol (UN 1230), and indicate Limited Quantity.

Option 6.

Glass Containers filled with sample - No Headspace:

Container - 4 oz Glass Jars.

Glass container filled with soil with no headspace and iced.

Caution: **This is NOT a preferred option for the CLP because:**

Samples collected in this manner lose most of their volatile analytes prior to analysis when the sample containers are opened and sub-sampled in the laboratory. This option is only available due to Regional requirements.

Regular Samples	2 Glass Jars (4 oz) filled with sample, no headspace 1 Vial - Dry (filled with soil, no headspace) 3 Total Containers
Regular Samples Requiring QC Analysis	2 Glass Jars (4 oz) filled with sample, no headspace 1 Vial - Dry (filled with soil, no headspace) 3 Total Containers

C. Caution:

1. Extreme care must be taken to ensure that frozen samples do not break during shipment.
2. Before adding soil to pre-weighed vials containing a stir bar, weigh the vials to confirm the tared weight. If the weight varies by more than 0.1 g, record the new weight on the label and the sample documentation. Do NOT add labels to these vials once the tared weight has been determined/confirmed.

D. Dry Samples:

All options include taking a sample in a dry 40 mL VOA vial (or a 4 oz wide mouth jar) with no headspace. No additional water, $NaHSO_4$, or methanol is added to this sample. This sample is taken to determine moisture content; therefore, it does not need to be tared or have a stir bar.

E. Iced or Frozen Samples:

1. Iced means cooled to 4°C (±2°C) immediately after collection.
2. Frozen means cooled to between -7°C and -15°C immediately after collection.

F. Sample Delivery:

CLP strongly recommends that all samples reach the laboratory by COB the next day after sample collection.

G. Notes:

1. For Option 4, samples can be preserved with $NaHSO_4$ either:
   - In the field; or
   - In the laboratory upon receipt. In this case, the sampler should put the following information in the Preservation Column of the TR/COC Record - "To be preserved at lab with $NaHSO_4$". This Regional Request should also be communicated to SMO so that the laboratory can be notified.
2. Regional QAPPs may require the use of Option 5. Please note that this option is for medium-level analysis ONLY.
3. If water, methanol, or $NaHSO_4$ preservative is added to the vials in the field, a field blank containing the appropriate liquid used in the vials should be sent to the laboratory for analysis.

H. Number of Containers Rationale:

The rationale for the number of containers (vials or samplers) required for the field sample and the required laboratory QC for each option is given as follows:

Option 1.

Rationale for Regular Vials:	1 vial for low-level analysis (water purge) 1 vial for backup low-level analysis 1 vial for medium-level analysis (methanol extraction)
Rationale for QC Vials:	2 vials for MS and MSD low-level analysis 2 vials for MS and MSD medium-level analysis 2 vials for backup (MS and MSD) low-level or medium-level analysis

Option 2.

Rationale for Regular Vials:	1 vial for low-level analysis (water purge) 1 vial for back up low-level analysis 1 vial dry for medium-level analysis (methanol extraction)
Rationale for QC Vials:	2 vials for MS and MSD low-level analysis 2 vials for MS and MSD medium-level analysis 2 vials for backup (MS and MSD) low-level or medium-level analysis
Medium-level: Analysis	Methanol will be added in the laboratory

Option 3.

Rationale for Regular Samples:	1 sampler for low-level analysis (water purge) 1 sampler for back up low-level analysis 1 sampler for medium-level analysis (methanol extraction)
Rationale for QC Samples:	2 samplers for MS and MSD low-level analysis 2 samplers for backup MS and MSD low-level analysis 2 samplers for MS and MSD medium-level analysis 2 samplers for backup MS and MSD medium-level analysis

Option 4a ($NaHSO_4$ added in the field).

Rationale for Regular Vials:	1 vial with water for low-level analysis (water purge) 1 vial with water for backup low-level analysis 1 vial dry for medium-level analysis (methanol extraction)
Rationale for QC Vials:	2 vials with water for MS and MSD low-level analysis 2 vials dry for MS and MSD medium-level analysis 2 vials for backup (MS and MSD) low-level or medium-level analysis

Option 4b ($NaHSO_4$ added in the laboratory).

Rationale for Regular Vials:	1 vial for low-level analysis (water purge) 1 vial for backup low-level analysis 1 vial for medium-level analysis (methanol extraction)
Rationale for QC Vials:	2 vials for MS and MSD low-level analysis 2 vials for MS and MSD medium-level analysis 2 vials for backup (MS and MSD) low-level or medium-level analysis

Option 5.

Rationale for Regular Samples:	1 vial for regular medium-level analysis 1 vial for back up medium-level analysis
Rationale for QC Samples:	2 samples for MS and MSD 2 samples for backup MS and MSD

Option 6.

In this option, all Regular and QC samples for both low-level and medium analysis are taken as subsamples from the same container.

Rationale for Regular Analysis	1 glass jar for low-level analysis and medium-level analysis **1 glass jar for backup low-level analysis and medium-level analysis**
Rationale for QC Analysis:	1 glass jar for low-level analysis and medium-level analysis **1 glass jar for backup low-level analysis and medium-level analysis**

Appendix C: General CLP Sample Collection Guidelines
VOAs in Water

Note: Regional guidance and/or specific Project Plan requirements will supersede the guidelines listed below.

Collect the following:

- At least two 40 mL glass containers with polytetrafluoroethylene (PTFE)-lined septa and open top screw-caps that are filled to capacity with no air bubbles, preserved to a pH of 2 with HCl, and cooled to 4°C (±2°C) immediately after collection. DO NOT FREEZE THE SAMPLES.
- If Selected Ion Monitoring (SIM) analysis is requested, at least two additional 40 mL glass containers with PTFE-lined septa and open top screw-caps that are filled to capacity with no air bubbles, preserved to a pH of 2 with HCl, and cooled to 4°C (±2°C) immediately after collection.

Test for Carbonates, Residual Chlorine, Oxidants, and Sulfides:

- It is very important that samplers obtain Regional guidance when testing and ameliorating for:
  - Carbonates;
  - Residual chlorine (e.g., municipal waters or industrial waste waters that are treated with chlorine prior to use or discharge); or
  - Oxidants.
- VOA samples containing carbonates react with the acid preservative causing effervescence (due to formation of carbon dioxide), which can cause loss of volatile analytes.
- Residual chlorine present in VOA samples can continue to react with dissolved organic matter. This continuous reaction may lead to inaccurate quantitation of certain analytes present in the sample at the time of collection.
- Residual chlorine and oxidants present in VOA samples can cause degradation of certain volatile analytes (e.g., styrene).

Perform the following for *Pre-Preserved* Vials:

1. Pour the sample slowly down the edge of the sample vial to avoid excess aeration or agitation of the sample during filling.
2. Fill the vial completely so that a reverse (convex) meniscus is present and ensure that there are no air bubbles present (either in the body or especially at the top of the vial).
3. Place the septum on the vial so that the PTFE side is in contact with the sample, and then firmly tighten the cap.
4. Gently flip the vial a few times to ensure that the sample is mixed with the acid preservative.
5. While holding the vial upright, gently tap the sample to check for air bubbles (either in the body or especially at the top of the vial).
6. If air bubbles are present, discard the sample and select a new vial in which to recollect a new sample. Repeat Steps 1 - 5 above.
7. Do NOT mix or composite samples for VOAs.
8. Cool sample to a temperature of 4°C (±2°C). Samplers should begin the cooling process in the field as samples are being collected. Double-bagged ice should be used. DO NOT FREEZE WATER SAMPLES.
9. Immediately transfer the vial to the sample shuttle (device that contains a "set" of VOA vials) once it has been collected. Do NOT allow ice to touch the vials.

Perform the Following for *Empty* Vials:

1. Rinse the vial with sample water prior to actual sample collection and preservation.

Note: Regions vary in their approach to pre-rinsing and/or re-using sample vials (e.g., some Regions do not recommend pre-rinsing and/or re-use of pre-cleaned containers using sample water). Be sure to follow Regional guidance.

2. Add 1-2 mL of acid preservative to the vial. Check to ensure that the sample you are collecting requires a preservative (follow Regional guidance).
3. Pour the sample slowly down the edge of the sample vial to avoid excess aeration and agitation of the sample.
4. Fill the vial completely so that a reverse (convex) meniscus is present and ensure that there are no air bubbles present (either in the body or especially at the top of the vial).
5. Place the septum on the vial so that the PTFE side is in contact with the sample, and then firmly tighten the cap.
6. Gently flip the vial a few times to ensure that the sample is mixed with the acid preservative.
7. While holding the vial upright, gently tap the vial to check for air bubbles (either in the body or especially at the top of the vial).
8. If air bubbles are present, discard the sample and recollect a new sample using the same sample vial. Repeat Steps 1 - 7 above.
9. Check the recollected sample for air bubbles. If air bubbles are present, additional sample water may be added to the vial to eliminate air bubbles. If there are air bubbles after three consecutive attempts to eliminate air bubbles by the addition of sample water, the entire sample and sample vial should be discarded and a new sample collected.
10. Do NOT mix or composite samples for VOAs.
11. Cool sample to a temperature of 4°C (±2°C). Samplers should begin the cooling process in the field as samples are being collected. Double-bagged ice should be used. DO <u>NOT</u> FREEZE WATER SAMPLES.
12. Immediately transfer the vial to the sample shuttle (device which contains a "set" of VOA vials) once it has been collected. Do NOT allow ice to touch the vials.

Things to Remember:

- Samples must be shipped as soon as possible, preferably on the same day as sample collection to avoid exceeding sample holding times. If overnight transit is not possible, samples should be maintained at 2 - 4°C until they are shipped to the laboratory.
- If samples are not preserved (a requirement for certain analytes), the technical holding time is shortened to 7 days.

Appendix D: Sampling Techniques and Considerations

During a sampling event, the sampler is expected to follow prescribed sampling techniques. The sampler should also be aware of any special sampling considerations, contaminant issues, and sample compositing and mixing methods that could affect their sampling efforts.

Note: Regional guidance will take precedence over any of the techniques and considerations listed below.

D.1 General Sampling Techniques

Information regarding surface water, sediment, soil, and groundwater sampling can be found in many documents including, but not limited to, the following sources:

- Compendium of ERT Surface Water and Sediment Sampling Procedures, EPA/540/P-91/005;
- Compendium of ERT Soil Sampling and Surface Geophysics Procedures, EPA/540/P-91/006;
- Compendium of ERT Groundwater Sampling Procedures, EPA/540/P-91/007;
- Quality Assurance Sampling Plan for Environmental Response (QASPER) software, Version 4.1, ERT; and
- *Requirements for the Preparation of Sampling and Analysis Plans*; United States Army Corps of Engineers, February 1, 2001, EM 200-1-3.

When working with potentially hazardous materials, samplers should follow USEPA and OSHA requirements, specific health and safety procedures, and DOT requirements.

D.2 Special Sampling Considerations

Samplers should refer to Regionally-developed SOPs to obtain specific procedures for properly collecting and preserving samples in the field. For additional guidance regarding sampling for VOAs in soil and water, see Appendices B and C. Samplers should obtain Regional guidance when testing and ameliorating for:

- Carbonates in VOA soil and water;
- Residual chlorine in VOA soil and water, or cyanide water;
- Oxidants in VOA soil and water; or
- Sulfides in cyanide.

D.3 Contaminant Sampling

Certain compounds can be detected in the parts-per-billion (ppb) and/or parts-per-trillion (ppt) range. Extreme care MUST be taken to prevent cross-contamination of these samples. The following precautions should be taken when trace contaminants are a concern:

- Disposable gloves should be worn each time a different location is sampled.
- When collecting both surface water and sediments, surface water samples should be collected first. This reduces the chance of sediment dispersal into surface water, and the resulting loss of surface water sample integrity.
- Sampling should occur in a progression from the least to the most contaminated area, if this information is known to the sampling team.
- Samplers should use equipment constructed of PTFE, stainless steel, or glass that has been properly pre-cleaned for collection of samples for trace organic and/or inorganic analyses. Equipment constructed of plastic or polyvinyl chloride (PVC) should NOT be used to collect samples for trace organic compound analyses.
- Equipment constructed of stainless steel should NOT be used to collect samples for trace metals analysis.

D.4 Sample Compositing

Sample compositing is a site-specific activity that must be conducted according to the SAP. Compositing is typically used for large sites under investigation to improve the precision (i.e., lower the variance) of the estimated average contaminant concentrations. **Samples for VOA analysis should NOT be composited to minimize loss of VOAs/analytes.**

Composite samples consist of a series of discrete grab samples that are mixed together to characterize the average composition of a given material. The discrete samples are usually of equal volume, but may be weighted to reflect an increased flow or volume. Regardless, all discrete samples must be collected in an identical manner and the number of grab samples forming a composite should be consistent. There are several compositing techniques that may be required such as:

- Flow-proportioned – Collected proportional to the flow rate during the compositing period by either a time-varying/constant volume or a time-constant/varying volume method. This technique is usually associated with wastewater or storm water runoff sampling.
- Time – Composed of a varying number of discrete samples collected at equal time intervals during the compositing period. This technique is typically used to sample wastewater and streams, and in some air sampling applications.
- Areal – Collected from individual grab samples collected in an area or on a cross-sectional basis. Areal composites are comprised of equal volumes of grab samples where all grabs are collected in an identical manner. This technique is typically used for estimating average contaminant concentrations in soils or sediments. This technique is useful when contaminants are present in nugget form (i.e., TNT chunks, lead shot, etc.), thus exhibiting large differences in concentration over a small sample area.
- Vertical – Collected from individual grab samples but taken from a vertical cross section. Vertical composites are comprised of equal volumes of grab samples where all grab samples are collected in an identical manner. Examples would include vertical profiles of a soil borehole or sediment columns.
- Volume – Collected from discrete samples whose aliquot volumes are proportional to the volume of sampled material. Volume composites are usually associated with hazardous waste bulking operations where the sample represents combined or bulked waste.

When compositing solid samples (i.e., sediment, soil, or sludge) for analysis of compounds present in trace quantities, use a stainless steel or PTFE bowl and spatula.

D.5 Sample Mixing and Homogenizing

Mixing of the sample for the remaining parameters is necessary to create a representative sample media. It is extremely important that solid samples be mixed as thoroughly as possible to ensure that the sample is as representative as possible of the sample location. Please refer to the project-specific SAP regarding instructions on removal of any extraneous materials (e.g., leaves, sticks, rocks, etc.). The mixing technique will depend on the physical characteristics of the solid material (e.g., particle size, moisture content, etc.). The mixing container should be large enough to hold the sample volume and accommodate the procedures without spilling. Both the mixing container (generally a bowl or tray) and the mixing implement should be properly decontaminated before use. Samples should be homogenized according to procedures listed in the project-specific SAP.

Samples for VOA analysis should not be mixed to minimize loss of volatile analytes.

Table D-1 provides a short procedure for mixing a soil sample with a small particle size (less than 1/4 in) and filling sample containers in the field.

Table D-1. Mixing a Sample and Filling Sample Containers

Step	Action
1	Roll the contents of the compositing container to the middle of the container and mix.
2	Quarter the sample and move to the sides of the container.
3	Mix each quarter individually, then combine and mix OPPOSITE quarters, then roll to the middle of the container.
4	Mix the sample once more, and then quarter the sample again.
5	Mix each quarter individually, then combine and mix ADJACENT corners, then roll to the middle of the container. The goal is to achieve a consistent physical appearance before sample containers are filled.
6	Flatten piled material into an oblong shape.
7	Using a flat-bottomed scoop, collect a strip of soil across the entire width of the short axis and place it into a sample container.
8	Repeat Step 7 at evenly-spaced intervals until the sample containers are filled.
9	Record the approximate quantity of each subsample in the field log book.

Appendix E: Sampling Checklists

Appendix E-1: Personnel Preparation Checklist

(Page 1 of 1)

Personnel Briefing	Yes	No	Comments:
1. Did you review sampling team responsibilities and identify individual(s) responsible for corrective actions?			
2. Did you ensure that you have met the appropriate personal safety and protection requirements?			
3. Did you identify sampling locations and receive permission to access them, as appropriate?			
4. Did you contact the appropriate utility companies PRIOR to the start of sampling? Note: By law, utility companies must be contacted prior to the start of digging/sampling so that any underground utilities (gas lines, water lines, electrical lines, etc.) can be marked. A list of one-call centers for each state may be found at: http://www.digsafely.com/contacts.htm.			
5. If sampling on private property, do you have sample receipts to provide to the property owner for all samples taken and removed from the property?			
6. Have you determined the number and type of samples to be collected?			
7. Did you review sample collection methods?			
8. Have you reviewed sample container requirements?			
9. Did you review decontamination requirements, procedures, and locations?			
10. Did you determine holding times and conditions?			
11. Did you determine Performance Evaluation (PE) and Quality Control (QC) sample requirements?			
12. Have you obtained shipping cooler temperature blanks, if required?			
13. Did you review sample label and tag requirements?			
14. Did you review Traffic Report/Chain of Custody (TR/COC) Record and custody seal requirements?			
15. Have you obtained the laboratory name, shipping addresses, and telephone number?			
16. Did you review cooler return instructions?			
17. Have you obtained shipping company information (name, telephone number, account number, pickup schedule)?			
18. Have you obtained shipping schedules?			
19. Did you review shipment reporting requirements and the appropriate contact names and telephone numbers for reporting?			
20. Have you included any sampler comments regarding sampling issues (e.g., low volumes, matrix, suspected concentrations based on field measurements)?			

Appendix E-2: General Sample Collection Checklist

(Page 1 of 1)

General Sample Collection	Yes	No	Comments:
1. Did you identify and mark the sampling location with buoys, flags, or stakes according to the sampling plans, maps, and grids?			
2. If the sampling location is inaccessible, did you contact the appropriate field or Regional personnel for instructions?			
3. Did you use the correct sampling equipment?			
4. Did you follow the correct decontamination procedures?			
5. Did you follow the correct collection procedures?			
6. Did you use the correct sample containers for each sample collected?			
7. Did you collect the correct volume for each sample?			
8. Did you collect the correct type of sample, including primary samples and Quality Control (QC) samples?			
9. Did you properly preserve each sample collected?			
10. Did you correctly document and label each sample with all necessary information? Under no circumstances should the site name appear on any documentation being sent to the laboratory.			
11. If sampling on private property, did you provide a sample receipt to the owner of the property for all samples taken and removed from the property?			

Appendix E-3: Completing Field Logbook Checklist

(Page 1 of 1)

Completing Field Logbook	Yes	No	Comments:
1. Did you use waterproof ink when writing in the field logbook?			
2. Did you document sampling project information such as: • Project name, ID, and location; • Names of samplers; • Geological observations, including maps; • Atmospheric conditions; • Field measurements; and • Sampling dates, times, and locations? Under no circumstances should the site name appear on any documentation being sent to the laboratory.			
3. Did you record sampling activity information such as: • Sampling dates and times; • Sample identifications; • Sample matrices; • Sample descriptions (e.g., odors and/or colors); • Number of samples taken; • Sampling methods/equipment; and • Description of QC samples?			
4. Did you document any and all deviations from the sampling plan?			
5. Did you document any and all difficulties in sampling and/or any unusual circumstances?			
6. Were all errors corrected by crossing a line through the error, initialing the error, dating the error, and then adding the correct information?			

Appendix E-4: Completing Handwritten Sample Labels Checklist

(Page 1 of 1)

Completing Handwritten Sample Labels	Yes	No	Comments:
1. Did the Region provide CLP Sample Numbers and SMO-assigned Case Numbers?			
2. If additional CLP Sample Numbers were needed, did you contact the appropriate Regional personnel?			
3. Were the CLP Sample Numbers and SMO-assigned Case Numbers on the labels correct? Organic CLP Sample Numbers begin with the Regional letter code, followed by letters and numbers. Inorganic CLP Sample Numbers begin with "M", followed by the Regional letter code, and then letters and numbers. Note: The following characters are not used in generating CLP Sample Numbers and should never appear on any paperwork send to the laboratory: I; O; U; and V. Also, the last character of a CLP Sample Number will never be a letter.			
4. Were samples uniquely numbered and designated to only one sample? Note: Samples collected for total metal and dissolved metal analyses must receive separate, unique, CLP Sample Numbers.			
5. Were Quality Control (QC) samples numbered accordingly?			
6. Were the specific requirements followed for total and dissolved metals analysis, QC and Performance Evaluation (PE) samples, and SW-846 Method 5035A?			
7. Were all temperature blanks labeled with "TEMPERATURE BLANK"?			
8. Was a sample label containing the CLP Sample Number, SMO-assigned Case Number, location, concentration, preservative, and the fraction/analysis, attached to each sample bottle or container as the sample was collected? Under no circumstances should the site name appear on any documentation being sent to the laboratory.			
9. Was clear tape placed over the sample labels to protect the labels from moisture and to help the labels adhere to the sample bottle?			
10. Were all errors corrected by crossing a line through the error, initialing the error, dating the error, and then adding the correct information?			

Appendix E-5: Completing Handwritten Sample Tags & Custody Seals Checklists

(Page 1 of 1)

Completing Handwritten Sample Tags	Yes	No	Comments:
1. Was waterproof ink used on the sample tags?			
2. If Regionally required for individual sample containers, was the project code on the sample tag completed?			
3. Was the station number on the sample tag completed?			
4 Was the date filled in using the format MM/DD/YYYY?			
5. Was the time of sample collection indicated in military time format HH:MM?			
6. Was the box checked indicating composite or grab sample?			
7. Was the station location on the sample tag completed?			
8. Did you indicate whether or not the sample was preserved by checking "yes" or "no?"			
9. Was the appropriate analysis indicated on the sample tag?			
10. Were the appropriate CLP Sample Number and SMO-assigned Case Number indicated and cross-referenced with the numbers on the sample label?			
11. Did you sign the sample tags?			
12 Did you attach the sample tag to the neck of the sample bottle with striang, stretch string, or wire (recommended method)? Do **NOT** use wire to attach a sample tag to a metal sample.			
13. Were all errors corrected by crossing a line through the error, initialing the error, dating the error, and then adding the correct information?			

Completing Custody Seals	Yes	No	Comments:
1. Did you sign and date the custody seal?			
2. Did you attach a completed custody seal to the sample bottle, container, or plastic bag, placing the seal over the cap or lid of each sample bottle or container or on the bag opening such that it will be broken if the sample bottle, container, or bag is opened or tampered with?			
3. As appropriate, did you attach the completed custody seal to the sample shipping container or cooler, placing the seal such that it will be broken if the container or cooler is opened or tampered with?			
4. Were all errors corrected by crossing a line through the error, initialing the error, dating the error, and then adding the correct information?			

Appendix E-6: Packing Sample Container Checklist

(Page 1 of 1)

Packing Sample Container	Yes	No	Comments:
1. Did you follow all State, Federal, Department of Transportation (DOT), and International Air Transportation Association (IATA) regulations governing the packaging of environmental and hazardous samples? Note: If samples contain methanol preservation (e.g., samples to be analyzed by SW-846 Method 5035A), refer to the packaging instructions in Appendix A.			
2. Were all CLP Sample Numbers, SMO-assigned Case Numbers, fractions/analyses, labels, tags, and custody seals attached to the correct sample containers?			
3. Was an inventory conducted of CLP Sample Numbers, SMO-assigned Case Numbers, fractions/analyses, and containers, and verified against the TR/COC Records?			
4. Were the correct number and type of Performance Evaluation (PE) and Quality Control (QC) samples collected?			
5. Were all sample containers sealed in clear plastic bags with the sample label and tag visible through the packaging?			
6. Were all soil/sediment samples known to contain dioxin securely enclosed in metal cans (e.g., paint cans) with the lids sealed?			
7. Was suitable absorbent packing material placed around the sample bottles or containers?			
8. Were the outsides of metal containers labeled properly with the CLP Sample Number, SMO-assigned Case Number, and the fraction/analysis of the sample inside?			

Appendix E-7: Packing Shipping Container Checklist
(Page 1 of 1)

Packing Shipping Container	Yes	No	Comments:
1. Were you shipping samples in a clean waterproof metal or hard plastic ice chest or cooler in good condition?			
2. Were all non-applicable labels from previous shipments removed from the container?			
3. Were all inside and outside drain plugs closed and covered with suitable tape (e.g., duct tape)?			
4. Was the inside of the cooler lined with plastic (e.g., large heavy-duty garbage bag)?			
5. Was the lined shipping cooler packed with noncombustible absorbent packing material?			
6. Were sample containers placed in the cooler in an upright position not touching one another?			
7. Was a sample shipping cooler temperature blank included in the cooler?			
8. Did the documentation in the cooler only address the samples in that cooler?			
9. Was the site name absent from all documentation? Under no circumstances should the site name appear on any documentation being sent to the laboratory.			
10. Was there sufficient packing material around and in between the sample bottles and cans to avoid breakage during transport?			
11. If required, was double-bagged ice placed on top and around sample bottles to keep the samples cold at 4°C (± 2° C)? Note Do Not Pack Loose Ice Into the Cooler!			
12. Was the top of the plastic liner fastened and secured with tape?			
13. Was a completed custody seal placed around the top of the fastened plastic liner (if required by the Region)?			
14. Were all sample documents enclosed within the cooler (e.g., TR/COC Record and cooler return instructions) in a waterproof plastic bag?			
15. Was the plastic bag, containing the documentation, taped to the underside of the cooler lid?			
16. Were cooler return instructions and airbills, if required, taped to the underside of the cooler lid?			
17. Was the return address of the cooler written with permanent ink on the underside of the cooler lid?			
18. Was tape placed around the outside of the entire cooler and over the hinges?			
19. Were the completed custody seals placed over the top edge of the cooler so the cooler cannot be opened without breaking the seals?			
20. Was the return address label attached to the top left corner of the cooler lid?			
21. Were instructional labels attached to the top of the cooler, as necessary (e.g., "This End Up," "Do Not Tamper With," or "Environmental Laboratory Samples")?			
22. If shipping hazardous samples, were the correct labels attached to the cooler (e.g., "Flammable Liquids", "Caution", or "Poison")?			
23. If shipping samples containing methanol as a preservative (e.g., samples to be analyzed by SW-846 Method 5035A), was a label used to indicate methanol, the United Nations (UN) identification number for methanol (UN 1230), and Limited Quantity?			

Appendix E-8: Shipping & Reporting CLP Samples Checklist

(Page 1 of 1)

	Shipping CLP Samples	Yes	No	Comments:
1.	Did you follow all State, Federal, Department of Transportation (DOT), and International Air Transportation Association (IATA) regulations governing the shipment of environmental and hazardous samples?			
2.	Was a separate airbill filled out for each cooler being shipped?			
3.	Was the airbill filled out completely, including correct laboratory name, address, and telephone number, identification of recipient as "Sample Custodian," and appropriate delivery option (e.g., overnight or Saturday)?			
4.	Was the completed airbill attached to the top of the cooler with the correct laboratory address?			
5.	If more than one cooler was being shipped to the same laboratory, were they marked as "1 of 2," "2 of 2," etc.?			
6.	Were the samples being shipped "overnight" through a qualified commercial carrier?			
	Reporting CLP Samples	**Yes**	**No**	**Comments:**
1.	Did you contact the Contract Laboratory Program Sample Management Office (SMO) on the same day samples were shipped?			
2.	If the samples were shipped after 5:00 PM Eastern Time (ET), were they reported to the RSCC (or designee) or to SMO by 8:00 AM ET the following business day?			
3.	Did you notify the RSCC (or designee) or SMO so that SMO will receive the delivery information by 3:00 PM ET on Friday for sample shipments that will be delivered to the laboratory on Saturday?			
4.	Did you provide the RSCC (or designee) or SMO with: • Your name, phone number, and Region number; • Case Number of the project; • Exact number of samples, matrix(ces), concentration(s), and type of analysis; • Laboratory(ies) to which the samples were shipped; • Carrier name and airbill number; • Date of shipment; • Date of next shipment; and • Any other information pertinent to the shipment?			

Appendix F: Glossary

Analyte -- The element, compound, or ion that is determined in an analytical procedure; the substance or chemical constituent of interest.

Analytical Services Branch (ASB) -- Directs the Contract Laboratory Program (CLP) from within the United States Environmental Protection Agency's (USEPA's) Office of Superfund Remediation and Technology Innovation (OSRTI) in the Office of Solid Waste and Emergency Response (OSWER).

Aroclor -- Polychlorinated biphenyls (PCBs) or a class of organic compounds with 1 to 10 chlorine atoms attached to biphenyl and a general chemical formula of $C_{12}H_{10-x}Cl_x$. PCBs, commercially produced as complex mixtures containing multiple isomers at different degrees of chlorination, were marketed in North America under the trade name Aroclor.

Case -- A finite, usually predetermined, number of samples collected over a given time period from a particular site. Case Numbers are assigned by the Sample Management Office (SMO). A Case consists of one or more Sample Delivery Groups (SDGs).

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) -- Initiated in December 1980, CERCLA provided broad federal authority to respond directly to the release or possible release or hazardous substances that may endanger human health or the environment. CERCLA also established a trust fund to provide for cleanup when no responsible party could be identified; hence CERCLA is commonly referred to as "Superfund".

Contract Laboratory Program (CLP) -- A national program of commercial laboratories under contract to support the USEPA's nationwide efforts to clean up designated hazardous waste sites by providing a range of chemical analytical services to produce environmental data of known and documented quality. This program is directed by USEPA's Analytical Services Branch (ASB).

Contract Laboratory Program Project Officer (CLP PO) -- Monitors technical performance of the contract laboratories in each Region.

Contract Laboratory Program Sample Management Office (CLP SMO) -- A contractor-operated facility operated under the CLP, awarded and administered by the USEPA, which provides necessary management, operations, and administrative support to the CLP. SMO coordinates and schedules sample analyses, tracks sample shipments and analyses, receives and tracks data for completeness and compliance, and processes laboratory invoices.

Custody Seal -- An adhesive label or tape that is used to seal a sample bottle or container that maintains chain-of-custody and that will break if the sample bottle or container is opened or tampered with.

Cyanide (Total) -- Cyanide ion and complex cyanides converted to hydrocyanic acid (HCN) by reaction in a reflux system of a mineral acid in the presence of magnesium ion.

Data Quality Objective (DQO) -- The requirements established to maintain the quality of the data being collected.

Data Validation -- Data validation is based on Region-defined criteria and limits, professional judgment of the data validator, and (if available) the Quality Assurance Project Plan (QAPP) and Sampling and Analysis Plan (SAP).

Equipment Blank -- A sample used to check field decontamination procedures. See Field Blank.

Field Blank -- Any blank sample that is submitted from the field. Each field blank is assigned its own unique USEPA Sample Number. A Field Blank checks for cross-contamination during sample collection, sample shipment, and in the laboratory. A field blank includes trip blanks, rinsates, equipment blanks, etc.

Field Duplicate -- Checks reproducibility of laboratory and field procedures and indicates non-homogeneity.

Field Operations Reporting Management System (FORMS) II Lite -- A stand-alone, Windows-based software application that enables samplers to automatically create and generate sample documentation both prior to and during a sampling event.

Field QC Sample -- Used to detect for contamination or error in the field.

Field Sample -- Primary sample material taken out in the field from which other samples, such as duplicates or split samples are derived. A field sample can be prepared in the field and sent for analysis in one or multiple containers, and is identified by a unique EPA Sample Number.

Field Sampling Plan (FSP) -- Developed to outline the actual steps and requirements pertaining to a particular sampling event, and explains, in detail, each component of the event to all involved samplers.

Holding Time -- The elapsed time expressed in hours, days, or months from the date of collection of the sample until the date of its analysis.

> **Contractual** -- The lengths of time that the CLP laboratory must follow to comply with the terms of the contract, and are described in the CLP analytical services Statements of Work (SOWs).
>
> **Technical** -- The maximum lengths of time that samples may be held from time of collection to time of preparation and/or analysis and still be considered valid.

Laboratory Blank -- See Method Blank.

Laboratory Duplicate -- A sample required by the laboratory's contract to check the precision of inorganic analyses.

Laboratory QC Sample -- An additional volume of an existing sample, as required by the laboratory's contract, used to detect contamination or error in the laboratory's practices.

Matrix -- The predominant material of which a sample to be analyzed is composed.

Matrix Spike (MS) -- Sample required by the laboratory's contract to check the accuracy of organic and inorganic analyses. It is an aliquot of a sample (water or soil) that is fortified (spiked) with known quantities of a specific compound and subjected to the entire analytical procedure. See Matrix Spike Duplicate.

Matrix Spike Duplicate (MSD) -- Sample required by the laboratory's contract to check the accuracy and precision of organic analyses. It is a second aliquot of the same matrix as the Matrix Spike (MS) that is spiked to determine the precision of the method. See Matrix Spike.

Method Blank -- An analytical control consisting of all reagents, internal standards and surrogate standards [or System Monitoring Compounds (SMCs) for volatile organic analysis], that is carried throughout the entire analytical procedure. The method blank is used to define the level of laboratory, background, and reagent contamination, also referred to as laboratory blank when defining the level of laboratory contamination.

Performance Evaluation (PE) Sample -- A sample of known composition provided by the USEPA for contractor analysis. Used by USEPA to evaluate contractor performance.

Pesticides -- Substances intended to repel, kill, or control any species designated a "pest", including weeds, insects, rodents, fungi, bacteria, and other organisms. Under the CLP, only organochlorine pesticides are analyzed (e.g., DDT, Dieldrin, Endrin, etc.).

Polychlorinated Biphenyls (PCBs) -- A group of toxic, persistent chemicals used in electrical transformers and capacitors for insulating purposes, and in gas pipeline systems as a lubricant. The sale and new use of PCBs were banned by law in 1979.

Quality Assurance (QA) -- An integrated system of management activities involving planning, implementation, assessment, reporting, and quality improvement to ensure that a process, item, or service is of the type and quality needed and expected by the customer..

Quality Assurance Project Plan (QAPP) -- Document written to meet requirements outlined in the document *EPA Guidance for Quality Assurance Project Plans* (EPA QA/R-5). Prepared in advance of field activities and used by samplers to develop any subsequent plans such as the Sampling Analysis Plan (SAP) or the Field Sampling Plan (FSP).

Quality Control (QC) -- The overall system of technical activities that measures the attributes and performance of a process, item, or service against defined standards to verify that they meet the stated requirements established by the customer; operational techniques and activities that are used to fulfill requirements for quality.

Regional Sample Control Center (RSCC) Coordinator -- In most Regions, coordinates sampling efforts and serves as the central point-of-contact for sampling questions and problems. Also assists in coordinating the level of Regional sampling activities to correspond with the monthly projected demand for analytical services.

Regional Site Manager -- Coordinates the development of data quality objectives and oversees project-specific remedial or removal contractors, State officials, or private parties conducting site sampling efforts.

Rinse Blank -- A sample used to check decontamination procedures. Also see Field Blank.

Routine Analytical Service (RAS) -- The standard inorganic and organic analyses available through the CLP.

Sample -- A discrete portion of material to be analyzed that is contained in single or multiple containers, and identified by a unique Sample Number.

Sample Delivery Group (SDG) – A unit within a sample Case that is used to identify a group of samples for delivery. An SDG is defined by the following, whichever is most frequent:

- Each Case of field samples received; or
- Each 20 field samples (excluding PE samples) within a Case; or
- Each 7 calendar day period (3 calendar day period for 7-day turnaround) during which field samples in a Case are received (said period beginning with the receipt of the first sample in the SDG).

In addition, all samples and/or sample fractions assigned to an SDG must have been scheduled under the same contractual turnaround time. Preliminary Results have no impact on defining the SDG. Sample may be assigned to SDGs by matrix (e.g., all soil samples in one SDG, all water samples in another) at the discretion of the laboratory.

Sample Label -- An identification label attached to a sample bottle or container to identify the sample.

Sample Number -- A unique number used to identify and track a sample. This number can be recorded on a sample label or written on the sample bottle or container using indelible ink.

Sample Tag -- A tag attached to a sample that identifies the sample and maintains chain-of-custody.

Sampling Analysis Plan (SAP) -- A document that explains how samples are to be collected and analyzed for a particular sampling event.

Semivolatile Organic Analyte (SVOA) -- A compound amenable to analysis by extraction of the sample using an organic solvent.

Statement of Work (SOW) -- A document that specifies how laboratories analyze samples under a particular Contract Laboratory Program (CLP) analytical program.

Superfund -- The program operated under the legislative authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Superfund Amendments and Reauthorization Act (SARA) that funds and carries out USEPA removal and remedial activities at hazardous waste sites. These activities include establishing the National Priorities List (NPL), investigating sites for inclusion on the list, determining their priority, and conducting and/or supervising cleanup and other remedial actions.

Superfund Amendments and Reauthorization Act (SARA) -- The 1986 amendment to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Traffic Report/Chain of Custody (TR/COC) Record -- A record that is functionally similar to a packing slip that accompanies a shipment of goods. Used as physical evidence of sample custody and functions as a permanent record for each sample collected.

Trip Blank -- A sample used to check for contamination during sample handling and shipment from field to laboratory. Also see Field Blank.

Volatile Organic Analyte (VOA) -- A compound amenable to analysis by the purge-and-trap technique. Used synonymously with the term purgeable compound.

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Appendix B -
Multi-Media, Multi-Concentration, Organic Analytical Service for Superfund
Quick Reference Fact Sheet, OLM04.3, August 2003

United States Environmental Protection Agency
Office of Solid Waste and Emergency Response
OSWER Document 9240.1-42-FSD
EPA Publication 540-F-03-005
August 2003

EPA

Multi-Media, Multi-Concentration, Organic Analytical Service for Superfund (OLM04.3)

Office of Superfund Remediation and Technology Innovations
Analytical Operations/Data Quality Center (5204G)

Quick Reference Fact Sheet

Under the legislative authority granted to the U.S. Environmental Protection Agency (EPA) under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), EPA develops standardized analytical methods for the measurement of various pollutants in environmental samples from known or suspected hazardous waste sites. Among the pollutants that are of concern to the EPA at such sites, are a series of volatile, semivolatile, and pesticide/Aroclor (pesticide/PCB) compounds that are analyzed using Gas Chromatography coupled with Mass Spectrometry (GC/MS) and Gas Chromatography with Electron Capture (GC/EC). The Analytical Operations/Data Quality Center (AOC) of the Office of Superfund Remediation and Technology Innovations (OSRTI) offers an analytical service that provides data from the analysis of water and soil/sediment samples for organic compounds for use in the Superfund decision-making process. Through a series of standardized procedures and a strict chain-of-custody, the organic analytical service produces data of known and documented quality. This service is available through the Superfund Contract Laboratory Program (CLP).

DESCRIPTION OF SERVICES

The new organic analytical service is available as of March 2003. It provides a technical and contractual frame work for laboratories to apply EPA/CLP analytical methods for the isolation, detection, and quantitative measurement of 48 volatile, 65 semivolatile, and 28 pesticide/Aroclor target compounds in water and soil/sediment environmental samples. The CLP provides the methods to be used and the specific technical, reporting, and contractual requirements, including Quality Assurance (QA), Quality Control (QC), and Standard Operating Procedures (SOPs), by which EPA evaluates the data. This service uses GC/MS and GC/EC methods to analyze the target compounds. Three data delivery turnarounds are available to CLP customers: 7, 14, and 21-day turnaround after laboratory receipt of the last sample in the set. In addition, there are 48 (for volatiles) and 72-hour (or semivolatiles and pesticides/Aroclors) preliminary data submission options available. The data associated with these Preliminary Results is due within the specified time after receipt of each sample at the laboratory. Options under this service include a closed system purge-and-trap method for low-level volatile soil analysis and methanol preservation for medium-level volatile soil analysis. In addition, data users may request modifications to the SOW that may include, but are not limited to, additional compounds, modified quantitation limits (e.g., lower volatile limits), additional cleanup options, and other requirements to enhance method performance.

DATA USES

This analytical service provides data which EPA uses for a variety of purposes, such as determining the nature and extent of contamination at a hazardous waste site, assessing priorities for response based on risks to human health and the environment, determining appropriate cleanup actions, and determining when remedial actions are complete. The data may be used in all stages in the investigation of a hazardous waste site including site inspections, Hazard Ranking System scoring, remedial investigations/feasibility studies, remedial design, treatability studies, and removal actions. In addition, this service provides data that will be available for use in Superfund enforcement/litigation activities.

TARGET COMPOUNDS

The compounds for which this service is applicable and the corresponding quantitation limits are listed in **Table 1**. For water samples, the lowest reportable quantitation limits are 10 ppb for the volatile compounds, 10 ppb for the semivolatile compounds, and 0.05 ppb for the pesticide/Aroclor compounds. For soil samples, the lowest reportable quantitation limits are 10 ppb for the volatile compounds, 330 ppb for the semivolatile compounds, and 1.7 ppb for the pesticide/Aroclor compounds. Specific sample quantitation limits will be highly matrix-dependent. Compounds identified with concentrations below the quantitation limit will be reported as estimated concentration values.

Table 1. Target Compound List and Contract Required Quantitation Limits (CRQLs) For OLM04.3*

	Quantitation Limits		
	Water (µg/L)	Low Soil (µg/Kg)	Modified Cal.[1] Levels (µg/L)
VOLATILES			
1. Dichlorodifluoromethane	10	10	0.50
2. Chloromethane	10	10	0.50
3. Vinyl Chloride	10	10	0.50
4. Bromomethane	10	10	0.50
5. Chloroethane	10	10	0.50
6. Trichlorofluoromethane	10	10	0.50
7. 1,1-Dichloroethene	10	10	0.50
8. 1,1,2-Trichloro-1,2,2-trifluoroethane	10	10	0.50
9. Acetone	10	10	10
10. Carbon Disulfide	10	10	0.50
11. Methyl Acetate	10	10	0.50
12. Methylene Chloride	10	10	0.50
13. trans-1,2-Dichloroethene	10	10	0.50
14. Methyl tert-Butyl Ether	10	10	0.50
15. 1,1-Dichloroethane	10	10	0.50
16. cis-1,2-Dichloroethene	10	10	0.50
17. 2-Butanone	10	10	10
18. Chloroform	10	10	0.50
19. 1,1,1-Trichloroethane	10	10	0.50
20. Cyclohexane	10	10	0.50
21. Carbon Tetrachloride	10	10	0.50
22. Benzene	10	10	0.50
23. 1,2-Dichloroethane	10	10	0.50
24. Trichloroethene	10	10	0.50
25. Methylcyclohexane	10	10	0.50
26. 1,2-Dichloropropane	10	10	0.50
27. Bromodichloromethane	10	10	0.50
28. cis-1,3-Dichloropropene	10	10	0.50
29. 4-Methyl-2-pentanone	10	10	10
30. Toluene	10	10	0.50
31. trans-1,3-Dichloropropene	10	10	0.50
32. 1,1,2-Trichloroethane	10	10	0.50
33. Tetrachloroethene	10	10	0.50
34. 2-Hexanone	10	10	0.50
35. Dibromochloromethane	10	10	10
36. 1,2-Dibromoethane	10	10	0.50
37. Chlorobenzene	10	10	0.50
38. Ethylbenzene	10	10	0.50
39. Xylenes (Total)	10	10	0.50
40. Styrene	10	10	0.50
41. Bromoform	10	10	0.50
42. Isopropylbenzene	10	10	0.50
43. 1,1,2,2-Tetrachloroethane	10	10	0.50
44. 1,3-Dichlorobenzene	10	10	0.50
45. 1,4-Dichlorobenzene	10	10	0.50
46. 1,2-Dichlorobenzene	10	10	0.50
47. 1,2-Dibromo-3-chloropropane	10	10	0.50
48. 1,2,4-Triclorobenzene	10	10	0.50

	Quantitation Limits	
	Water (µg/L)	Low Soil (µg/Kg)
SEMIVOLATILES		
49. Benzaldehyde	10	330
50. Phenol	10	330
51. bis-(2-Chloroethyl)ether	10	330
52. 2-Chlorophenol	10	330
53. 2-Methylphenol	10	330
54. 2,2'-oxybis (1-Chloropropane)	10	330
55. Acetophenone	10	330
56. 4-Methylphenol	10	330
57. N-Nitroso-di-n-propylamine	10	330
58. Hexachloroethane	10	330
59. Nitrobenzene	10	330
60. Isophorone	10	330
61. 2-Nitrophenol	10	330
62. 2,4-Dimethylphenol	10	330
63. bis-(2-Chloroethoxy) methane	10	330
64. 2,4-Dichlorophenol	10	330
65. Naphthalene	10	330
66. 4-Chloroaniline	10	330
67. Hexachlorobutadiene	10	330
68. Caprolactam	10	330
69. 4-Chloro-3-methylphenol	10	330
70. 2-Methylnaphthalene	10	330
71. Hexachlorocyclo-pentadiene	10	330
72. 2,4,6-Trichlorophenol	10	330
73. 2,4,5-Trichlorophenol	25	830
74. 1,1'-Biphenyl	10	330
75. 2-Chloronaphthalene	10	330
76. 2-Nitroaniline	25	830
77. Dimethylphthalate	10	330
78. 2,6-Dinitrotoluene	10	330
79. Acenaphthylene	10	330
80. 3-Nitroaniline	25	830
81. Acenaphthene	10	330
82. 2,4-Dinitrophenol	25	830
83. 4-Nitrophenol	25	830
84. Dibenzofuran	10	330
85. 2,4-Dinitrotoluene	10	330
86. Diethylphthalate	10	330
87. Fluorene	10	330
88. 4-Chlorophenyl-phenyl ether	10	830
89. 4-Nitroaniline	25	830
90. 4,6-Dinitro-2-methylphenol	25	830
91. N-Nitrosodiphenylamine	10	330
92. 4-Bromophenyl-phenylether	10	330
93. Hexachlorobenzene	10	330
94. Atrazine	10	330
95. Pentachlorophenol	25	830
96. Phenanthrene	10	330
97. Anthracene	10	330

	Quantitation Limits	
	Water (µg/L)	Low Soil (µg/Kg)
98. Carbazole	10	330
99. Di-n-butylphthalate	10	330
100. Fluoranthene	10	330
101. Pyrene	10	330
102. Butylbenzylphthalate	10	330
103. 3,3'-Dichlorobenzidine	10	330
104. Benzo(a)anthracene	10	330
105. Chrysene	10	330
106. bis-(2-Ethylhexyl)phthalate	10	330
107. Di-n-octylphthalate	10	330
108. Benzo(b)fluoranthene	10	330
109. Benzo(k)fluoranthene	10	330
110. Benzo(a)pyrene	10	330
111. Indeno(1,2,3-cd)pyrene	10	330
112. Dibenz(a,h)anthracene	10	330
113. Benzo(g,h,i)perylene	10	330
PESTICIDES/AROCLORS (PESTICIDES/PCBs)	**Water (µg/L)**	**Soil (µg/Kg)**
114. alpha-BHC	0.05	1.7
115. beta-BHC	0.05	1.7
116. delta-BHC	0.05	1.7
117. gamma-BHC (Lindane)	0.05	1.7
118. Heptachlor	0.05	1.7
119. Aldrin	0.05	1.7
120. Heptachlor epoxide	0.05	1.7
121. Endosulfan I	0.05	1.7
122. Dieldrin	0.10	3.3
123. 4,4'-DDE	0.10	3.3
124. Endrin	0.10	3.3
125. Endosulfan II	0.10	3.3
126. 4,4'-DDD	0.10	3.3
127. Endosulfan sulfate	0.10	3.3
128. 4,4'-DDT	0.10	3.3
129. Methoxychlor	0.50	17
130. Endrin ketone	0.10	3.3
131. Endrin aldehyde	0.10	3.3
132. alpha-Chlordane	0.05	1.7
133. gamma-Chlordane	0.05	1.7
134. Toxaphene	5.0	170
135. Aroclor-1016	1.0	33
136. Aroclor-1221	2.0	67
137. Aroclor-1232	1.0	33
138. Aroclor-1242	1.0	33
139. Aroclor-1248	1.0	33
140. Aroclor-1254	1.0	33
141. Aroclor-1260	1.0	33

*For volatiles, quantitation limits for medium soils are approximately 130 times the quantitation limits for low soils. For semivolatile medium soils, quantitation limits are approximately 30 times the quantitation limits for low soils.

[1]Modified quantitation limits are available under the Flexibility Clause.

The list of target compounds for this service was originally derived from the EPA Priority Pollutant List of 129 compounds. In the years since inception of the CLP, compounds have been added to and removed from the Target Compound List (TCL), based on advances in analytical methods, evaluation of method performance data, and the needs of the Superfund program.

For drinking water and groundwater type samples, use of the low concentration organic analytical service is recommended.

METHODS AND INSTRUMENTATION

For volatile water samples, 5 mL of water sample is added to a purge and trap device and purged with an inert gas at room temperature. For volatile low-level soil samples, a 5 g aliquot of soil is added to a purge and trap device with 5 mL of reagent water then purged with an inert gas at 40°C; or a 5 g aliquot (pre-weighed in the field) is purged from a closed-system purge and trap device at 40°C. For volatile medium-level soil samples, a measured amount is collected/extracted with methanol and an aliquot of the methanol extract is added to reagent water and purged at room temperature. For both water and soil samples, the volatiles purged from the sample are trapped on a solid sorbent. They are subsequently desorbed by rapidly heating the sorbent and then introduced into a GC/MS system.

For semivolatile and pesticide/Aroclor water samples, a 1 L aliquot is extracted with methylene chloride using a continuous liquid-liquid extractor or separatory funnel [for pesticides/Aroclors only]. For low-level semivolatile soil and pesticide/Aroclor soil samples, a 30 g soil/sediment sample is extracted with methylene chloride/acetone using sonication, automated soxhlet, or pressurized fluid extraction techniques. For medium-level semivolatile soil samples, a 1 g aliquot is extracted with methylene chloride using the techniques mentioned above for low-level soil samples. For both water and soil samples, the extract is concentrated, subjected to fraction-specific cleanup procedures, and analyzed by GC/MS for semivolatiles or GC/EC for pesticides/Aroclors. **Table 2** summarizes the methods and instruments used in this analytical service.

PRESERVATION OF VOLATILE SOIL SAMPLES

All soil sample containers that are not chemically preserved should be frozen upon receipt at the laboratory. This includes closed-system vials received from the sampler; closed-system vials generated by the laboratory; low headspace vials containing sample for moisture determination (or for analysis by the old Method 5030 protocol); and all QC samples.

DATA DELIVERABLES

Data deliverables for this service include hardcopy data reporting forms and supporting raw data. In addition to the hardcopy deliverable, contract laboratories must also submit the same data electronically. The laboratory must submit data to EPA within 7, 14, or 21 days after laboratory receipt of the last sample in the set. Preliminary data must be submitted within 48 hours (for volatiles) or 72 hours (for semivolatiles and pesticides/Aroclors) after receipt of each sample at the laboratory. EPA then processes the data through an automated Data Assessment Tool (DAT). DAT is a complete CLP data assessment package. DAT incorporates Contract Compliance Screening (CCS) and Computer-Aided Data Review and Evaluation (CADRE) to provide EPA Regions with PC-compatible reports, spreadsheets, and electronic files within 24 to 48 hours from the receipt of the data. This automated tool facilitates the transfer of analytical data into Regional databases. In addition to the Regional electronic reports, the CLP laboratories are provided with a data assessment report that documents the instances of noncompliance. The laboratory has 6 days to reconcile defective data and resubmit the data to EPA. EPA then reviews the data for noncompliance and sends a final data assessment report to the CLP laboratory and the Region.

QUALITY ASSURANCE

The QA process consists of management review and oversight at the planning, implementation, and completion stages of the environmental data collection activity. This process ensures that the data provided are of the quality required.

During the implementation of the data collection effort, QA activities ensure that the QC system is functioning effectively and that the deficiencies uncovered by the QC system are corrected. After environmental data are collected, QA activities focus on assessing the quality of data to determine its suitability to support enforcement or remedial decisions.

Each contract laboratory prepares a Quality Assurance Plan (QAP) with the objective of providing sound analytical chemical measurements. The QAP must specify the policies, organization, objectives, and functional guidelines, as well as the QA and QC activities designed to achieve the data quality requirements for this analytical service.

QUALITY CONTROL

The QC process includes those activities required during analytical data collection to produce data of known and documented quality. The analytical data acquired from QC procedures are used to estimate and evaluate the analytical results and to determine the necessity for, or the effect of, corrective action procedures. The QC procedures required for this analytical service are shown in **Table 3.**

Table 2. Methods and Instruments

Fraction	Water	Soil
Volatiles	Purge-and-trap followed by GC/MS analysis.	Purge-and-trap or closed-system purge-and-trap followed by GC/MS analysis.
Semivolatiles	Continuous liquid-liquid extraction followed by GC/MS analysis.	Sonication, automated soxhlet, or pressurized fluid extraction followed by GC/MS analysis.
Pesticides/Aroclors	Continuous liquid-liquid or separatory funnel extraction followed by dual column GC/EC analysis.	Sonication, automated soxhlet, or pressurized fluid extraction followed by dual column GC/EC analysis.

Table 3. Quality Control

QC Operation	Frequency
System Monitoring Compounds (volatiles)	Added to each sample, standard, and blank.
Surrogates (for semivolatiles and pesticides/Aroclors)	Added to each sample, standard, and blank.
Method Blanks (volatiles)	Analyzed at least every 12 hours for each matrix and level.
Method Blanks (semivolatiles and pesticides/Aroclors)	Prepared with each group of 20 samples or less of same matrix and level, or each time samples are extracted by the same procedure.
Instrument Blank (volatiles)	Analyzed after a sample that contains compounds at concentrations greater than the calibration range.
Instrument Blank (pesticides/Aroclors)	Every 12 hours on each GC column used for analysis.
Storage Blanks (volatiles)	Prepared and stored with each set of samples.
GC/MS Mass Calibration and Ion Abundance Patterns (volatiles and semivolatiles)	Every 12 hours for each instrument used for analysis.
GC Resolution Check (pesticides/Aroclors)	Prior to initial calibration, on each instrument used for analysis.
Initial Calibration	Upon initial set up of each instrument, whenever instrument maintenance/modification has been performed, and each time continuing calibration fails to meet the acceptance criteria.
Continuing Calibration	Every 12 hours for each instrument used for analysis.
Internal Standards (volatiles and semivolatiles)	Added to each sample, standard, and blank.
Matrix Spike and Matrix Spike Duplicate	Once every 20 or fewer samples of same fraction, matrix, and level in an SDG.

PERFORMANCE MONITORING ACTIVITIES

Laboratory performance monitoring activities are provided primarily by AOC and the Regions to ensure that contract laboratories are producing data of the appropriate quality. EPA performs on-site laboratory audits, data package audits, GC/MS and/or GC/EC tape audits, and evaluates laboratory performance through the use of blind performance evaluation samples.

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Appendix C -
Multi-Media, Multi-Concentration, Inorganic Analytical Service for Superfund
Quick Reference Fact Sheet, ILM05.4, January 2007

United States Environmental Protection Agency | Office of Solid Waste and Emergency Response | OSWER Document 9200.5-170-FS EPA Publication 540-FS-07-004 January 2007

Multi-Media, Multi-Concentration, Inorganic Analytical Service for Superfund (ILM05.4)

Office of Superfund Remediation & Technology Innovation
Analytical Services Branch (5203P)

Quick Reference Fact Sheet

Under the legislative authority granted to the U.S. Environmental Protection Agency (EPA) under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), EPA develops standardized analytical methods for the measurement of various pollutants in environmental samples from known or suspected hazardous waste sites. Among the pollutants that are of concern to EPA at such sites is a series of inorganic analytes and cyanide that are analyzed using Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES), Inductively Coupled Plasma-Mass Spectrometry (ICP-MS), Cold Vapor Atomic Absorption (CVAA), and colorimetric techniques. The Analytical Services Branch (ASB) of the Office of Superfund Remediation and Technology Innovation (OSRTI) offers an analytical service that provides data from the analysis of water/aqueous and soil/sediment samples for inorganic analytes for use in the Superfund and other decision making processes. Through a series of standardized procedures and a strict chain-of-custody, the inorganic analytical service produces data of known and documented quality. This service is available through the Superfund Contract Laboratory Program (CLP).

DESCRIPTION OF SERVICES

The inorganic analytical service provides a technical and contractual framework for laboratories to utilize EPA/CLP analytical methods. These methods are used in the isolation, detection and quantitative measurement of 23 target analyte metals (including mercury) and cyanide in both water and soil/sediment environmental samples. The CLP provides the methods to be used and the specific technical, reporting, and contractual requirements, including Quality Assurance (QA), Quality Control (QC), and Standard Operating Procedures (SOPs), by which EPA evaluates the data.

Three data delivery turnaround times are available to CLP customers: 7, 14, and 21-day turnaround after receipt of the last sample in the set. A 72-hour preliminary data submission option also is available for all turnaround times. The data associated with these Preliminary Results is due within 72 hours after receipt of each sample at the laboratory. In addition, data users may include, but are not limited to, additional analytes and modified quantitation limits.

The ILM05.4 analytical service is based on the previous ILM05.3 analytical service. The update to ILM05.4 includes a change to the Contract Required Quantitation Limits (CRQL) for the Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) analysis for vanadium in water matrices from 1 µg/L to 5 µg/L.

DATA USES

This analytical service provides data that EPA uses for a variety of purposes. Examples include determining the nature and extent of contamination at a hazardous waste site, assessing priorities for response based on risks to human health and the environment, determining appropriate cleanup actions, and determining when remedial actions are complete. The data may be used in all stages in the investigation of a hazardous waste site including: site inspections, Hazard Ranking System scoring, remedial investigations/feasibility studies, remedial design, treatability studies, and removal actions. In addition, this service provides data that are available for use in Superfund enforcement/litigation activities.

TARGET ANALYTES

The inorganic analytes and quantitation limits for which this service is applicable are listed in Table 1. Specific detection limits are method and matrix dependent.

The list of target analytes for this service was originally derived from the EPA Priority Pollutant List of 129 compounds. In the years since the inception of the CLP, analytes have been added to and deleted from the Target Analyte List (TAL), based on advances in analytical methods, evaluation of method performance data, and the needs of the Superfund program.

Table 1. Inorganic Target Analyte List and Contract Required Quantitation Limits (CRQLs)

	Analyte	ICP-AES CRQL for Water (µg/L)	ICP-AES CRQL for Soil (mg/kg)	ICP-MS CRQL for Water (µg/L)
1.	Aluminum	200	20	--
2.	Antimony	60	6	2
3.	Arsenic	10	1	1
4.	Barium	200	20	10
5.	Beryllium	5	0.5	1
6.	Cadmium	5	0.5	1
7.	Calcium	5000	500	--
8.	Chromium	10	1	2
9.	Cobalt	50	5	1
10.	Copper	25	2.5	2
11.	Iron	100	10	--
12.	Lead	10	1	1
13.	Magnesium	5000	500	--
14.	Manganese	15	1.5	1
15.	Mercury	0.2	0.1	--
16.	Nickel	40	4	1
17.	Potassium	5000	500	--
18.	Selenium	35	3.5	5
19.	Silver	10	1	1
20.	Sodium	5000	500	--
21.	Thallium	25	2.5	1
22.	Vanadium	50	5	5
23.	Zinc	60	6	2
24.	Cyanide	10	2.5	--

METHODS AND INSTRUMENTATION

The Contractor will demonstrate the ability to meet certain program data quality objectives prior to analyzing field samples. The laboratories must document methods used to generate analytical results and determine Method Detection Limits (MDLs). ICP-Atomic Emission Spectroscopy (ICP-AES) is used to analyze water, sediment, sludge, and soil samples. Water and soil samples are treated with acids and heated. The digestates are then analyzed for trace metals by an atomic emission optical spectroscopic technique. The samples are nebulized and the aerosol is transported to a plasma torch. The atomic-line emission spectra are dispersed and a photosensitive device monitors line intensities.

ICP-Mass Spectrometry (ICP-MS) is used to determine the concentration of dissolved and total recoverable elements in water/aqueous samples. The sample material is introduced, by nebulization, into radio frequency plasma where desolvation, atomization, and ionization take place. The ions are extracted from the plasma through a differentially pumped vacuum interface and separated based on their mass-to-charge ratio.

Cold Vapor Atomic Absorption (CVAA) is used to analyze water, sediment, sludge, and soil samples for total mercury. Organo-mercury compounds may also be present and will need to be broken down and converted to mercuric ions to respond to the CVAA techniques. For water samples, organic compounds are oxidized and then reacted with a strong reducing agent. The volatile free mercury is then driven from the reaction flask by bubbling air through the solution. The air stream carries the mercury atoms to an absorption cell; which is then placed in the light path of the AA spectrophotometer. For soil/sediment, the samples undergo acid digestion/oxidation followed by reduction and measurement by conventional cold vapor technique.

Various water types, sediment, sludge, and soil samples are also analyzed for total cyanide. Hydrocyanic acid (HCN) is released through a reflux-distillation and absorbed in a scrubber containing sodium hydroxide solution. The cyanide ion is determined colorimetrically by converting it to cyanogen chloride (CNCl).

Table 2 summarizes the methods and instruments used in this analytical service.

DATA DELIVERABLES

Data deliverables for this service include both hardcopy/electronic data reporting forms and supporting raw data. The laboratory must submit data to EPA within 7-, 14- or 21-days, or preliminary data must be submitted within 72 hours after laboratory receipt of each sample in the set, if requested. EPA then processes the data through an automated Data Assessment Tool (DAT). DAT is a complete CLP data assessment package. DAT incorporates Contract Compliance Screening (CCS) and Computer-Aided Data Review and Evaluation (CADRE)

Table 2. Methods and Instruments

Analyte	Instrument	Method
Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Ni, K, Se, Ag, Na, Tl, V, Zn	Inductively Coupled Plasma - Atomic Emission Spectroscopy (ICP-AES)	ICP analysis of atomic-line emission spectra.
Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Ni, Se, Ag, Tl, V, Zn	ICP - Mass Spectrometry (ICP-MS)	ICP analysis of ions separated on basis of mass-to-charge ratio.
Mercury (Hg)	Cold Vapor Atomic Absorption (CVAA)	Acid digestion/oxidation followed by reduction and CVAA analysis.
Cyanide (CN)	Colorimeter or Spectrophotometer	Distillation followed by colorimetric analysis.

Table 3. Quality Control

QC Operation	Frequency
Instrument Calibration	Daily or each time instrument is set up.
Initial Calibration Verification	Following each instrument calibration for each wavelength or mass used.
Initial Calibration Blank	Following each instrument calibration, immediately after the Initial Calibration Verification (ICV).
Continuing Calibration Verification	For each wavelength or mass used, at a frequency of 10% or every two hours of a run, whichever is more frequent, and at the beginning and end of each run.
Continuing Calibration Blank	10% or every two hours of a run, whichever is more frequent, and at the beginning and end of each run. Performed immediately after the last Continuing Calibration Verification (CCV).
CRQL Check Standard (CRI)	Every 20 analytical samples and at the beginning and end of each run, but not before the ICV. Performed before the Interference Check Sample.
Interference Check Sample	For ICP-AES, every 20 analytical samples and at the beginning and end of each run, immediately after the CRI. For ICP-MS, at the beginning of the run.
Serial Dilution for ICP	For each matrix type or for each SDG, whichever is more frequent.
Preparation Blank	For each SDG or each sample preparation and analysis procedure per batch of prepared samples.
Laboratory Control Sample	For each SDG or each sample preparation and analysis procedure per batch of prepared samples, except aqueous mercury and cyanide.
Spike Sample	For each matrix type or for each SDG, whichever is more frequent.
Post Digestion/Distillation Spike	Each time Spike Sample Recovery is outside QC limits.
Duplicate Sample Analysis	For each matrix type or for each SDG, whichever is more frequent.
ICP-MS Tune	Prior to calibration.
Method Detection Limit Determination	Prior to contract, annually thereafter, and after major instrument maintenance.
Interelement Corrections	Prior to contract, quarterly thereafter, and after major instrument adjustment.
Linear Range Analysis	Prior to contract, and quarterly thereafter.

review to provide EPA Regions with electronic reports (PC-compatible reports, spreadsheets, and electronic files) within 24 to 48 hours from the receipt of the data This automated tool facilitates the transfer of analytical data into Regional databases. DAT can also be used to assist in the data validation process at the Region. In addition to the Regional electronic reports, the CLP laboratories are provided with a data assessment report that documents the instances of noncompliance. The laboratory has four business days to reconcile defective data and resubmit the data to EPA. EPA then reviews the data for noncompliance and sends a final data assessment report to the CLP laboratory and the Region.

QUALITY ASSURANCE

The Quality Assurance (QA) process consists of management review and oversight at the planning, implementation, and completion stages of the environmental data collection activity and ensures that the data provided are of the quality required. During the data collection effort, QA activities ensure that the Quality Control (QC) system is functioning effectively and that the deficiencies uncovered by the QC system are corrected. After environmental data are collected, QA activities focus on assessing the quality of data obtained to determine its suitability to support enforcement or remedial decisions. Each contract laboratory will establish a Quality Assurance Plan (QAP) with the objective of providing sound analytical chemical measurements. The QAP must specify the policies, organization, objectives, functional guidelines, and specific QA/QC activities designed to achieve the data quality requirements for this analytical service.

QUALITY CONTROL

The QC process includes those activities required during analytical data collection to produce data of known and documented quality.

The analytical data acquired from QC procedures are used to estimate and evaluate the analytical results and to determine the necessity for, or the effect of, corrective action procedures. The QC procedures required for this analytical service are shown in **Table 3**.

PERFORMANCE MONITORING ACTIVITIES

Laboratory performance monitoring activities are provided primarily by ASB and the Regions to ensure that contract laboratories are producing data of the appropriate quality. EPA performs on-site laboratory audits, data package audits, and evaluates laboratory performance with blind performance evaluation samples.

For more information, or for suggestions to improve this analytical service, please contact:

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Appendix D -
Low Concentration Organic Analytical Service for Superfund (Water Matrix)
Quick Reference Fact Sheet, OLC03.2, June 2001

United States Environmental Protection Agency | Office of Solid Waste and Emergency Response | EPA 540-F-01-013 Publication 9240.0-37FS June 2001

EPA

Low Concentration Organic Analytical Service for Superfund (Water Matrix) (OLC03.2)

Office of Emergency and Remedial Response
Analytical Operations/Data Quality Center (5204G)

Quick Reference Fact Sheet

Under the legislative authority granted to the U.S. Environmental Protection Agency (EPA) under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), EPA develops standardized analytical methods for the measurement of various pollutants in environmental samples from known or suspected hazardous waste sites. Among the pollutants that are of concern to the EPA at such sites are a series of volatile, semivolatile, and pesticide/Aroclor (pesticide/PCB) compounds that are analyzed using Gas Chromatography coupled with Mass Spectrometry (GC/MS) and Gas Chromatography with an Electron Capture Detector (GC/ECD). The Analytical Operations/Data Quality Center (AOC) of the Office of Emergency and Remedial Response (OERR) offers an analytical service that provides data from the analysis of water samples for low concentration organic compounds for use in the Superfund decision-making process. Through a series of standardized procedures and a strict chain-of-custody, the low concentration organic analytical service produces data of known and documented quality. This service is available through the Superfund Contract Laboratory Program (CLP).

DESCRIPTION OF SERVICES

The low concentration organic analytical service provides a contractual framework for laboratories to apply EPA/CLP analytical methods for the isolation, detection, and quantitative measurement of 50 volatile, 65 semivolatile, and 28 pesticide/Aroclor (pesticide/PCB) target compounds in water samples. The analytical service provides the methods to be used and the specific contractual requirements, by which EPA evaluates the data. The options for data turnaround time for this contract are 7, 14, or 21 days after laboratory receipt of the last sample in the Sample Delivery Group (SDG). This service uses Gas Chromatography/Mass Spectrometry (GC/MS) and Gas Chromatography with Electron Capture Detector (GC/ECD) techniques to analyze the target compounds.

DATA USES

This analytical service provides data that EPA uses for a variety of purposes such as: determining the nature and extent of contamination at a hazardous waste site; assessing priorities for response based on risks to human health and the environment; determining appropriate cleanup actions; and determining when remedial actions are complete. The data may be used at all stages in the investigation of hazardous waste sites including: site inspections; Hazard Ranking System (HRS) scoring; remedial investigation/feasibility studies; remedial design; treatability studies; and removal actions. In addition, this service provides data that are available for use in Superfund enforcement/litigation activities.

TARGET COMPOUNDS

The compounds and quantitation limits for which this service is applicable are listed in **Table 1**. The lowest reportable quantitation limits are 0.50 µg/L for the volatile compounds, 5.0 µg/L for the semivolatile compounds, and 0.01 µg/L for the pesticide/Aroclor compounds. The list of target compounds for this service was originally derived from the EPA Priority Pollutant List of 129 compounds. In the years since the inception of the CLP, compounds have been added to and deleted from the Target Compound List (TCL), based on advances in analytical methods, evaluation of method performance data, and the needs of the Superfund program.

METHODS AND INSTRUMENTATION

For volatiles, 25 mL of sample is added to a purge-and-trap device. A solution of 14 Deuterated Monitoring Compounds (DMCs) and a solution of internal standards are added to the sample which is then purged with an inert gas at room temperature.

Table 1. Target Compound List and Contract Required Quantitation Limits (CRQLs) in µg/L (OLC03.2)

VOLATILES		Quantitation Limits µg/L	SEMIVOLATILES		Quantitation Limits µg/L			Quantitation Limits µg/L
1.	Dichlorodifluoromethane	0.5	51.	Benzaldehyde	5	101.	Di-n-butylphthalate	5
2.	Chloromethane	0.5	52.	Phenol	5	102.	Fluoranthene	5
3.	Vinyl Chloride	0.5	53.	bis-(2-Chloroethyl) ether	5	103.	Pyrene	5
4.	Bromomethane	0.5	54.	2-Chlorophenol	5	104.	Butylbenzylphthalate	5
5.	Chloroethane	0.5	55.	2-Methylphenol	5	105.	3,3'-Dichlorobenzidine	5
6.	Trichlorofluoromethane	0.5	56.	2,2'-oxybis (1-Chloropropane)[1]	5	106.	Benzo(a)anthracene	5
7.	1,1-Dichloroethene	0.5	57.	Acetophenone	5	107.	Chrysene	5
8.	1,1,2-Trichloro-1,2,2-trifluoroethane	0.5	58.	4-Methylphenol	5	108.	bis-(2-Ethylhexyl) phthalate	5
9.	Acetone	5	59.	N-Nitroso-di-n-propylamine	5	109.	Di-n-octylphthalate	5
10.	Carbon Disulfide	0.5	60.	Hexachloroethane	5	110.	Benzo(b)fluoranthene	5
11.	Methyl Acetate	0.5	61.	Nitrobenzene	5	111.	Benzo(k)fluoranthene	5
12.	Methylene Chloride	0.5	62.	Isophorone	5	112.	Benzo(a)pyrene	5
13.	trans-1,2-Dichloroethene	0.5	63.	2-Nitrophenol	5	113.	Indeno(1,2,3-cd)pyrene	5
14.	Methyl tert-Butyl Ether	0.5	64.	2,4-Dimethylphenol	5	114.	Dibenzo(a,h)anthracene	5
15.	1,1-Dichloroethane	0.5	65.	bis (2-Chloroethoxy) methane	5	115.	Benzo(g,h,i)perylene	5
16.	cis-1,2-Dichloroethene	0.5	66.	2,4-Dichlorophenol	5			
17.	2-Butanone	5	67.	Naphthalene	5		**PESTICIDES/AROCLORS**	
18.	Bromochloromethane	0.5	68.	4-Chloroaniline	5		**(PESTICIDES/PCBs)**	
19.	Chloroform	0.5	69.	Hexachlorobutadiene	5			
20.	1,1,1-Trichloroethane	0.5	70.	Caprolactam	5	116.	alpha-BHC	0.01
21.	Cyclohexane	0.5	71.	4-Chloro-3-methylphenol	5	117.	beta-BHC	0.01
22.	Carbon Tetrachloride	0.5	72.	2-Methylnaphthalene	5	118.	delta-BHC	0.01
23.	Benzene	0.5	73.	Hexachlorocyclopentadiene	5	119.	gamma-BHC (Lindane)	0.01
24.	1,2-Dichloroethane	0.5	74.	2,4,6-Trichlorophenol	5	120.	Heptachlor	0.01
25.	Trichloroethene	0.5	75.	2,4,5-Trichlorophenol	20	121.	Aldrin	0.01
26.	Methylcyclohexane	0.5	76.	1,1'-Biphenyl	5	122.	Heptachlor epoxide[2]	0.01
27.	1,2-Dichloropropane	0.5	77.	2-Chloronaphthalene	5	123.	Endosulfan I	0.01
28.	Bromodichloromethane	0.5	78.	2-Nitroaniline	20	124.	Dieldrin	0.02
29.	cis-1,3-Dichloropropene	0.5	79.	Dimethylphthalate	5	125.	4,4'-DDE	0.02
30.	4-Methyl-2-pentanone	5	80.	2,6-Dinitrotoluene	5	126.	Endrin	0.02
31.	Toluene	0.5	81.	Acenaphthylene	5	127.	Endosulfan II	0.02
32.	trans-1,3-Dichloropropene	0.5	82.	3-Nitroaniline	20	128.	4,4'-DDD	0.02
33.	1,1,2-Trichloroethane	0.5	83.	Acenaphthene	5	129.	Endosulfan sulfate	0.02
34.	Tetrachloroethene	0.5	84.	2,4-Dinitrophenol	20	130.	4,4'-DDT	0.02
35.	2-Hexanone	5	85.	4-Nitrophenol	20	131.	Methoxychlor	0.10
36.	Dibromochloromethane	0.5	86.	Dibenzofuran	5	132.	Endrin ketone	0.02
37.	1,2-Dibromoethane	0.5	87.	2,4-Dinitrotoluene	5	133.	Endrin aldehyde	0.02
38.	Chlorobenzene	0.5	88.	Diethylphthalate	5	134.	alpha-Chlordane	0.01
39.	Ethylbenzene	0.5	89.	Fluorene	5	135.	gamma-Chlordane	0.01
40.	Xylenes (total)	0.5	90.	4-Chlorophenyl-phenylether	5	136.	Toxaphene	1.0
41.	Styrene	0.5	91.	4-Nitroaniline	20	137.	Aroclor-1016	0.20
42.	Bromoform	0.5	92.	4,6-Dinitro-2-methylphenol	20	138.	Aroclor-1221	0.40
43.	Isopropylbenzene	0.5	93.	N-Nitrosodiphenylamine	5	139.	Aroclor-1232	0.20
44.	1,1,2,2-Tetrachloroethane	0.5	94.	1,2,4,5 Tetrachlorobenzene	5	140.	Aroclor-1242	0.20
45.	1,3-Dichlorobenzene	0.5	95.	4-Bromophenyl-phenylether	5	141.	Aroclor-1248	0.20
46.	1,4-Dichlorobenzene	0.5	96.	Hexachlorobenzene	5	142.	Aroclor-1254	0.20
47.	1,2-Dichlorobenzene	0.5	97.	Atrazine	5	143.	Aroclor-1260	0.20
48.	1,2-Dibromo-3-chloropropane	0.5	98.	Pentachlorophenol	5			
49.	1,2,4-Trichlorobenzene	0.5	99.	Phenanthrene	5			
50.	1,2,3-Trichlorobenzene	0.5	100.	Anthracene	5			

[1]Previously known by the name bis (2-chloroisopropyl) ether.
[2]Only the exo-epoxy isomer (isomer B) of heptachlor epoxide is reported on the data reporting forms.

The volatiles purged from the sample are trapped on a solid sorbent. They are subsequently desorbed into a GC/MS system.

For semivolatile and pesticide/Aroclor water samples, a 1-L aliquot is extracted with methylene chloride using continuous liquid-liquid extraction or a separatory funnel (for pesticides/Aroclors only). For pesticide/Aroclors, the aliquot is spiked with a solution of two surrogate compounds before extraction. The extract is dried, concentrated, and subjected to cleanup prior to GC/ECD analysis. For semivolatiles, the aliquot is acidified to a pH of 2.0 and a solution of 16 DMCs is added before extraction. The extract is dried and concentrated, internal standards are added, and then it is analyzed by GC/MS. **Table 2** summarizes the preparation methods and instruments used in this analytical service.

DATA DELIVERABLES

Data deliverables for this service include hardcopy data reporting forms, supporting raw data, and electronic data on diskette or other means specified by EPA. The laboratory must submit data to EPA within 7, 14, or 21 days after laboratory receipt of the last sample in the SDG. EPA then checks the data for compliance with contract requirements. A report of instances of noncompliance is distributed to the laboratory and the Region within 7 days from the receipt of the data. The laboratory has 7 days from receipt of the report to reconcile defective data and resubmit the data to EPA. EPA then screens the data and sends a final data assessment report to the laboratory and the Region.

QUALITY ASSURANCE

The Quality Assurance (QA) process consists of management review and oversight at the planning, implementation, and completion stages of the environmental data collection activity. This process ensures that the data provided are of the quality required.

During the implementation of the data collection effort, QA activities ensure that the Quality Control (QC) system is functioning effectively and that the deficiencies uncovered by the QC system are corrected. After environmental data are collected, QA activities focus on assessing the quality of data to determine its suitability to support enforcement or remedial decisions. Each contract laboratory prepares a Quality Assurance Plan (QAP) with the objective of providing sound analytical chemical measurements. The QAP must specify the policies, organization, objectives, and functional guidelines, as well as the QA/QC activities designed to achieve the data quality requirements for this analytical service.

QUALITY CONTROL

The QC process includes those activities required during analytical data collection to produce data of known and documented quality. The analytical data acquired from QC procedures are used to estimate and evaluate the analytical results and to determine the necessity for, or the effect of, corrective action procedures. The QC requirements for this analytical service are shown in **Table 3**.

PERFORMANCE MONITORING ACTIVITIES

Laboratory performance monitoring activities are provided primarily by AOC and the Regions to ensure that contract laboratories are producing data of the appropriate quality. EPA performs on-site laboratory audits, data package audits, and GC/MS tape audits, and evaluates laboratory performance through the use of blind PE samples.

Table 2. Methods and Instruments

Fraction	Preparation Method	Analytical Instrument
Volatiles	Purge-and-trap	GC/MS analysis
Semivolatiles	Continuous liquid-liquid extraction	GC/MS analysis
Pesticides/Aroclors (Pesticides/PCBs)	Continuous liquid-liquid or separatory funnel extraction	GC/ECD analysis

Table 3. Quality Control

QC Operation	Frequency
Deuterated Monitoring Compounds (DMCs) (volatiles and semivolatiles)	Added to each sample, standard, and blank.
Method Blanks (volatiles)	Analyzed at least every 12 hours.
Method Blanks [semivolatiles and pesticides/Aroclors (pesticides/PCBs)]	Prepared with each group of 20 field samples or less, or each time samples are extracted.
Instrument Blank (volatiles)	Analyzed after a sample that contains compounds at concentrations greater than the calibration range.
Instrument Blank [pesticides/Aroclors (pesticides/PCBs)]	Every 12 hours and preceding all groups of acceptable sample analysis.
Surrogates [pesticides/Aroclors (pesticides/PCBs)]	Added to each sample, standard, and blank.

Table 3. Quality Control (Continued)

QC Operation	Frequency
Storage Blank (volatiles)	Prepared and stored with each group of samples. Analyzed after all samples in the SDG have been analyzed.
Instrument Performance Check (volatiles and semivolatiles)	Prior to any analysis and every 12 hours.
GC Resolution Check [pesticides/Aroclors (pesticides/PCBs)]	Prior to initial calibration on each GC column used for analysis.
Initial Calibration	Upon initial set up of each instrument, after major instrument maintenance or modification, and each time continuing calibration fails to meet the acceptance criteria.
Continuing Calibration (volatiles and semivolatiles)	Every 12 hours for each instrument used for analysis.
Calibration Verification [pesiticides/Aroclor (pesticides/PCBs)]	Beginning and end of each 12-hour data collection period.
Internal Standards (volatiles and semivolatiles)	Added to each sample, standard, and blank.
Laboratory Control Sample (LCS) [pesticides/Aroclor (pesticides/PCBs)]	Prepared and analyzed once per SDG.
Performance Evaluation (PE) Sample	Prepared and analyzed (if provided) with every 20 field samples in an SDG or for each SDG, whichever is most frequent.
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	Performed only when requested by Region. Performed with every 20 field samples in an SDG or for each SDG, whichever is most frequent.
Method Detection Limit (MDL)	Run before any samples analyzed under contract (annually thereafter) and after major instrument maintenance.
Sulfur Cleanup Blank [pesticides/Aroclor (pesticides/PCBs)]	Only when part of a set of samples extracted together requires sulfur removal.
Sample Cleanup by Florisil Cartridge	Performed on all sample extracts and method blank extracts.
Florisil Cartridge Performance Check [pesticides/Aroclor (pesticides/PCBs)]	Performed at least once on each lot of cartridges used for sample cleanup or every 6 months, whichever is most frequent.

For more information, or for suggestions to improve this analytical service, please contact:

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Appendix E –
Multi-Media, Multi-Concentration, Organic Analytical Service for Superfund,
Quick Reference Fact Sheet, SOM01.2, August 2007

United States Environmental Protection Agency

Office of Solid Waste and Emergency Response

OSWER Document 9200.5-171-FS
EPA Publication 540-FS-07-001
August 2007

Multi-Media, Multi-Concentration, Organic Analytical Service for Superfund (SOM01.2)

Office of Superfund Remediation and Technology Innovation (OSRTI)
Analytical Services Branch (ASB) (5203P)

Quick Reference Fact Sheet

Under the legislative authority granted to the U.S. Environmental Protection Agency (EPA) under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), EPA develops standardized analytical methods for the measurement of various pollutants in environmental samples from known or suspected hazardous waste sites. Among the pollutants that are of concern to the EPA at such sites are a series of volatile, semivolatile, pesticide, and Aroclor compounds that are analyzed using gas chromatography coupled with mass spectrometry (GC/MS) and gas chromatography with an electron capture detector (GC/ECD). The Analytical Services Branch (ASB) of the Office of Superfund Remediation and Technology Innovation (OSRTI) offers an analytical service that provides data from the analysis of water and soil/sediment samples for organic compounds for use in the Superfund decision-making process. Through a series of standardized procedures and a strict chain-of-custody, the organic analytical service produces data of known and documented quality. This service is available through the Superfund Contract Laboratory Program (CLP).

DESCRIPTION OF SERVICES

This new organic analytical service provides a technical and contractual framework for laboratories to apply EPA/CLP analytical methods for the isolation, detection, and quantitative measurement of 52 volatile, 67 semivolatile, 21 pesticide, and 9 Aroclor target compounds in water and soil/sediment environmental samples. The CLP provides the methods to be used and the specific technical, reporting, and contractual requirements, including Quality Assurance (QA), Quality Control (QC), and Standard Operating Procedures (SOPs), by which EPA evaluates the data. This service uses GC/MS and GC/ECD methods to analyze the target compounds.

Three data delivery turnarounds are available to CLP customers: 7-day, 14-day, and 21-day turnaround after laboratory receipt of the last sample in the set. In addition, there are 48-hour (for trace volatiles and volatiles) and 72-hour (for semivolatiles, pesticides, and Aroclors) preliminary data submission options available. Options under this service include a closed system purge-and-trap method for low-level volatile soil analysis and methanol preservation for medium-level volatile soil analysis. In addition, data users may request modifications to the SOW that may include, but are not limited to, additional compounds, sample matrices other than soil/sediment or water, lower quantitation limits, and other requirements to enhance method performance.

DATA USES

This analytical service provides data which EPA uses for a variety of purposes, such as determining the nature and extent of contamination at a hazardous waste site, assessing priorities for response based on risks to human health and the environment, determining appropriate cleanup actions, and determining when remedial actions are complete. The data may be used in all stages in the investigation of a hazardous waste site including, but not limited to: site inspections; Hazard Ranking System (HRS) scoring; remedial investigations/Feasibility Studies (FSs); remedial design; treatability studies; and removal actions. In addition, this service provides data that will be available for use in Superfund enforcement/litigation activities.

TARGET COMPOUNDS

Table 1 lists the compounds for which this service is applicable and the corresponding quantitation limits. Specific quantitation limits are highly matrix-dependent.

Table 1. Target Compound List (TCL) and Contract Required Quantitation Limits (CRQLs) for SOM01.2*

	Quantitation Limits				
	Trace Water by SIM (µg/L)	Trace Water (µg/L)	Low Water (µg/L)	Low Soil (µg/kg)	Med. Soil (µg/kg)
VOLATILES					
1. Dichlorodifluoromethane		0.50	5.0	5.0	250
2. Chloromethane		0.50	5.0	5.0	250
3. Vinyl Chloride		0.50	5.0	5.0	250
4. Bromomethane		0.50	5.0	5.0	250
5. Chloroethane		0.50	5.0	5.0	250
6. Trichlorofluoromethane		0.50	5.0	5.0	250
7. 1,1-Dicholoroethene		0.50	5.0	5.0	250
8. 1,1,2-Trichloro-1,2,2-trifluoroethane		0.50	5.0	5.0	250
9. Acetone		5.0	10	10	500
10. Carbon Disulfide		0.50	5.0	5.0	250
11. Methyl acetate		0.50	5.0	5.0	250
12. Methylene chloride		0.50	5.0	5.0	250
13. trans-1,2-Dichloroethene		0.50	5.0	5.0	250
14. Methyl tert-butyl ether		0.50	5.0	5.0	250
15. 1,1-Dichloroethane		0.50	5.0	5.0	250
16. cis-1,2-Dichloroethene		0.50	5.0	5.0	250
17. 2-Butanone		5.0	10	10	500
18. Bromochloromethane		0.50	5.0	5.0	250
19. Chloroform		0.50	5.0	5.0	250
20. 1,1,1-Trichloroethane		0.50	5.0	5.0	250
21. Cyclohexane		0.50	5.0	5.0	250
22. Carbon tetrachloride		0.50	5.0	5.0	250
23. Benzene		0.50	5.0	5.0	250
24. 1,2-Dichloroethane		0.50	5.0	5.0	250
25. 1,4-Dioxane			100	100	5000
26. Trichloroethene		0.50	5.0	5.0	250
27. Methylcyclohexane		0.50	5.0	5.0	250
28. 1,2-Dichloropropane		0.50	5.0	5.0	250
29. Bromodichloromethane		0.50	5.0	5.0	250
30. cis-1,3-Dichloropropene		0.50	5.0	5.0	250
31. 4-Methyl-2-pentanone		5.0	10	10	500
32. Toluene		0.50	5.0	5.0	250
33. trans-1,3-Dichloropropene		0.50	5.0	5.0	250
34. 1,1,2-Trichloroethane		0.50	5.0	5.0	250
35. Tetrachloroethene		0.50	5.0	5.0	250
36. 2-Hexanone		5.0	10	10	500
37. Dibromochloromethane		0.50	5.0	5.0	250
38. 1,2-Dibromoethane	0.050	0.50	5.0	5.0	250
39. Chlorobenzene		0.50	5.0	5.0	250

	Quantitation Limits				
	Trace Water by SIM (µg/L)	Trace Water (µg/L)	Low Water (µg/L)	Low Soil (µg/kg)	Med. Soil (µg/kg)
VOLATILES (CON'T)					
40. Ethylbenzene		0.50	5.0	5.0	250
41. o-Xylene		0.50	5.0	5.0	250
42. m, p-Xylene		0.50	5.0	5.0	250
43. Styrene		0.50	5.0	5.0	250
44. Bromoform		0.50	5.0	5.0	250
45. Isopropylbenzene		0.50	5.0	5.0	250
46. 1,1,2,2-Tetrachloroethane		0.50	5.0	5.0	250
47. 1,3-Dichlorobenzene		0.50	5.0	5.0	250
48. 1,4-Dichlorobenzene		0.50	5.0	5.0	250
49. 1,2-Dichlorobenzene		0.50	5.0	5.0	250
50. 1,2-Dibromo-3-chloropropane	0.050	0.50	5.0	5.0	250
51. 1,2,4-Trichlorobenzene		0.50	5.0	5.0	250
52. 1,2,3-Trichlorobenzene		0.50	5.0	5.0	250

SEMIVOLATILES	Low Water by SIM (µg/L)	Low Water (µg/L)	Low Soil by SIM (µg/kg)	Low Soil (µg/kg)	Med. Soil (µg/kg)
53. Benzaldehyde		5.0		170	5000
54. Phenol		5.0		170	5000
55. bis-(2-chloroethyl) ether		5.0		170	5000
56. 2-Chlorophenol		5.0		170	5000
57. 2-Methylphenol		5.0		170	5000
58. 2,2'-Oxybis (1-chloropropane)		5.0		170	5000
59. Acetophenone		5.0		170	5000
60. 4-Methylphenol		5.0		170	5000
61. N-Nitroso-di-n propylamine		5.0		170	5000
62. Hexachloroethane		5.0		170	5000
63. Nitrobenzene		5.0		170	5000
64. Isophorone		5.0		170	5000
65. 2-Nitrophenol		5.0		170	5000
66. 2,4-Dimethylphenol		5.0		170	5000
67. Bis (2-chloroethoxy) methane		5.0		170	5000
68. 2,4-Dichlorophenol		5.0		170	5000
69. Napthalene	0.10	5.0	3.3	170	5000
70. 4-Chloroaniline		5.0		170	5000
71. Hexachlorobutadiene		5.0		170	5000
72. Caprolactam		5.0		170	5000
73. 4-Chloro-3-methylphenol		5.0		170	5000
74. 2-Methylnapthalene	0.10	5.0	3.3	170	5000
75. Hexachlorocyclo-pentadiene		5.0		170	5000
76. 2,4,6-Trichlorophenol		5.0		170	5000
77. 2,4,5-Trichlorophenol		5.0		170	5000

* For volatiles, quantitation limits for medium soils are approximately 50 times the quantitation limits for low soils. For semivolatile medium soils, quantitation limits are approximately 30 times the quantitation limits for low soils.

Table 1. Target Compound List (TCL) and Contract Required Quantitation Limits (CRQLs) for SOM01.2* (Con't)

	Quantitation Limits				
	Low Water by SIM (µg/L)	Low Water (µg/L)	Low Soil by SIM (µg/kg)	Low Soil (µg/kg)	Med. Soil (µg/kg)
SEMIVOLATILES (CON'T)					
78. 1,1'-Biphenyl		5.0		170	5000
79. 2-Chloronapthalene		5.0		170	5000
80. 2-Nitroaniline		10		330	10000
81. Dimethylphthalate		5.0		170	5000
82. 2,6-Dinitrotoluene		5.0		170	5000
83. Acenaphthylene	0.10	5.0	3.3	170	5000
84. 3-Nitroaniline		10		330	10000
85. Acenaphthene	0.10	5.0	3.3	170	5000
86. 2,4-Dinitrophenol		10		330	10000
87. 4-Nitrophenol		10		330	10000
88. Dibenzofuran		5.0		170	5000
89. 2,4-Dinitrotoluene		5.0		170	5000
90. Diethylphthalate		5.0		170	5000
91. Fluorene	0.10	5.0	3.3	170	5000
92. 4-Chlorophenyl-phenyl ether		5.0		170	5000
93. 4-Nitroaniline		10		330	10000
94. 4,6-Dinitro-2-methylphenol		10		330	10000
95. N-Nitrosodiphenylamine		5.0		170	5000
96. 1,2,4,5-Tetrachlorobenzene		5.0		170	5000
97. 4-Bromophenyl-phenylether		5.0		170	5000
98. Hexachlorobenzene		5.0		170	5000
99. Atrazine		5.0		170	5000
100. Pentachlorophenol	0.20	10	6.7	330	10000
101. Phenanthrene	0.10	5.0	3.3	170	5000
102. Anthracene	0.10	5.0	3.3	170	5000
103. Carbazole		5.0		170	5000
104. Di-n-butylphthalate		5.0		170	5000
105. Fluoranthene	0.10	5.0	3.3	170	5000
106. Pyrene	0.10	5.0	3.3	170	5000
107. Butylbenzylphthalate		5.0		170	5000
108. 3,3'-Dichlorobenzidine		5.0		170	5000
109. Benzo (a) anthracene	0.10	5.0	3.3	170	5000
110. Chrysene	0.10	5.0	3.3	170	5000
111. Bis (2-ethylhexyl) phthalate		5.0		170	5000
112. Di-n-octylphthalate		5.0		170	5000
113. Benzo (b) fluoroanthene	0.10	5.0	3.3	170	5000
114. Benzo (k) fluoroanthene	0.10	5.0	3.3	170	5000

	Quantitation Limits				
	Low Water by SIM (µg/L)	Low Water (µg/L)	Low Soil by SIM (µg/kg)	Low Soil (µg/kg)	Med. Soil (µg/kg)
SEMIVOLATILES (CON'T)					
115. Benzo (a) pyrene	0.10	5.0	3.3	170	5000
116. Indeno (1,2,3-cd)-pyrene	0.10	5.0	3.3	170	5000
117. Dibenzo (a,h)-anthracene	0.10	5.0	3.3	170	5000
118. Benzo (g,h,i) perylene	0.10	5.0	3.3	170	5000
119. 2,3,4,6-Tetrachlorophenol		5.0		170	5000
PESTICIDES	Water (µg/L)			Soil (µg/kg)	
120. alpha-BHC	0.050			1.7	
121. beta-BHC	0.050			1.7	
122. delta-BHC	0.050			1.7	
123. gamma-BHC (Lindane)	0.050			1.7	
124. Heptachlor	0.050			1.7	
125. Aldrin	0.050			1.7	
126. Heptachlor epoxide	0.050			1.7	
127. Endosulfan I	0.050			1.7	
128. Dieldrin	0.10			3.3	
129. 4,4'-DDE	0.10			3.3	
130. Endrin	0.10			3.3	
131. Endosulfan II	0.10			3.3	
132. 4-4'-DDD	0.10			3.3	
133. Endosulfan sulfate	0.10			3.3	
134. 4-4'-DDT	0.10			3.3	
135. Methoxychlor	0.50			17	
136. Endrin ketone	0.10			3.3	
137. Endrin aldehyde	0.10			3.3	
138. alpha-Chlordane	0.050			1.7	
139. gamma-Chlordane	0.050			1.7	
140. Toxaphene	5.0			170	
AROCLORS	Water (µg/L)			Soil (µg/kg)	
141. Aroclor-1016	1.0			33	
142. Aroclor-1221	1.0			33	
143. Aroclor-1232	1.0			33	
144. Aroclor-1242	1.0			33	
145. Aroclor-1248	1.0			33	
146. Aroclor-1254	1.0			33	
147. Aroclor-1260	1.0			33	
148. Aroclor-1262	1.0			33	
149. Aroclor-1268	1.0			33	

* For volatiles, quantitation limits for medium soils are approximately 50 times the quantitation limits for low soils. For semivolatile medium soils, quantitation limits are approximately 30 times the quantitation limits for low soils.

The TCL for this service was originally derived from the EPA Priority Pollutant List of 129 compounds. In the years since the inception of the CLP, compounds have been added to and removed from the TCL, based on advances in analytical methods, evaluation of method performance data, and the needs of the Superfund program. The SOM analytical service combines the previous OLM and OLC services into one method. For example, drinking water and ground water type samples may be analyzed using the Trace Volatiles method in SOM.

METHODS AND INSTRUMENTATION

For trace volatile water samples, 25 mL of water sample is added to a purge-and-trap device and purged with an inert gas at room temperature. For low/medium volatile water samples, 5 mL of water sample is added to a purge-and-trap device and purged with an inert gas at room temperature. Higher purge temperatures may be used for both trace and low/medium volatile analyses if all technical acceptance criteria is met for all standards, samples, and blanks. For low-level volatile soil samples, organic compounds are generally determined by analyzing approximately 5 g of sample in a closed-system purge-and-trap device at 40°C. For a medium-level soil sample, a soil sample of 5 g is collected, preserved, and/or extracted with methanol and an aliquot of methanol extract is added to 5 mL reagent water and purged at room temperature. For water and soil samples, the volatiles purged from the sample are trapped on a solid sorbent. The purged volatiles are subsequently desorbed by rapidly heating and backflushing with helium, and then introduced into a GC/MS system.

For semivolatile, pesticide, and Aroclor water samples, a 1 L aliquot of sample is extracted with methylene chloride using a continuous liquid-liquid extractor or separatory funnel (for pesticides and Aroclors only). For low-level semivolatile, pesticide, and Aroclor soil samples, a 30 g soil/sediment sample is extracted with methylene chloride/acetone using sonication, automated Soxhlet/Dean-Stark (SDS) extraction, or pressurized fluid extraction techniques. For medium-level semivolatile soil samples, a 1g aliquot is extracted with methylene chloride using the techniques mentioned above for low-level soil samples. For both water and soil samples, the extract is concentrated, subjected to fraction-specific cleanup procedures, and analyzed by GC/MS for semivolatiles or GC/ECD for pesticides and Aroclors. **Table 2** summarizes the methods and instruments used in this analytical service.

DATA DELIVERABLES

Data deliverables for this service include hardcopy data reporting forms and supporting raw data. In addition to the hardcopy deliverable, contract laboratories must also submit the same data electronically. The laboratory must submit data to EPA within 7, 14, or 21-days after laboratory receipt of the last sample in set [or preliminary data within 48 hours (for trace volatiles and volatiles) or 72 hours (for semivolatiles, pesticides, and Aroclors)] after laboratory receipt of each sample. EPA then processes the data through an automated Data Assessment Tool (DAT). DAT provides EPA Regions with PC-compatible reports, spreadsheets, and electronic files within 24-48 hours from the receipt of the data for use in data validation. This automated tool also facilitates the transfer of analytical data into Regional databases. In addition to the Regional electronic reports, the CLP laboratories are provided with a data assessment report that documents the instances of noncompliance. The laboratory has 6 business days to reconcile defective data and resubmit the data to EPA. EPA then reviews the data for noncompliance and sends a final data assessment report to the CLP laboratory and the Region.

QUALITY ASSURANCE (QA)

The QA process consists of management review and oversight at the planning, implementation, and completion stages of the environmental data collection activity. This process ensures that the data provided are of known and documented quality.

During the implementation of the data collection effort, QA activities ensure that the Quality Control (QC) system is functioning effectively and that the deficiencies uncovered by the QC system are corrected. After environmental data are collected, QA activities focus on assessing the quality of data to determine its suitability to support enforcement or remedial decisions.

Each contract laboratory prepares a Quality Assurance Plan (QAP) with the objective of providing sound analytical chemical measurements. The QAP must specify the policies, organization, objectives, and functional guidelines, as well as the QA and QC activities designed to achieve the data quality requirements in the contract.

QUALITY CONTROL (QC)

The QC process includes those activities required during analytical data collection to produce data of known and documented quality. The analytical data acquired from QC procedures are used to estimate and evaluate the analytical results and to determine the necessity for, or the effect of, corrective action procedures. The QC procedures required for this analytical service are provided in **Table 3.**

Table 2. Methods and Instruments

Fraction	Water	Soil
Trace Volatiles	Purge-and-trap followed by GC/MS analysis	N/A
Volatiles	Purge-and-trap followed by GC/MS analysis	Purge-and-trap or closed-system purge-and-trap followed by GC/MS analysis
Semivolatiles	Continuous liquid-liquid extraction (CLLE) followed by GC/MS analysis	Sonication, automated SDS extraction, or pressurized fluid extraction followed by GC/MS analysis
Pesticides	CLLE or separatory funnel extraction followed by dual column GC/ECD analysis	Sonication, automated SDS extraction or pressurized fluid extraction followed by dual column GC/ECD analysis
Aroclors	CLLE or separatory funnel extraction followed by dual column GC/ECD analysis	Sonication, automated SDS extraction or pressurized fluid extraction followed by dual column GC/ECD analysis

Table 3. Quality Control (QC)

QC Operation	Frequency
Deuterated Monitoring Compounds (DMCs) (trace volatiles, volatiles, and semivolatiles)	Added to each sample, standard, and blank
Surrogates (pesticides and Aroclors)	Added to each sample, standard, and blank
Method Blanks (trace volatiles and volatiles)	Analyzed at least every 12 hours for each matrix and level
Method Blanks (semivolatiles, pesticides, and Aroclors)	Prepared with each group of 20 samples or less of same matrix and level, or each time samples are extracted by the same procedure
Instrument Blank (trace volatiles and volatiles)	Analyzed after a sample which contains compounds at concentrations greater than the calibration range
Instrument Blank (pesticides and Aroclors)	Every 12 hours on each GC column used for analysis
Storage Blanks (trace volatiles and volatiles)	Prepared and stored with each set of samples
GC/MS Mass Calibration and Ion Abundance Patterns (trace volatiles, volatiles, and semivolatiles)	Every 12 hours for each instrument used for analysis
GC Resolution Check (pesticides)	Prior to initial calibration, on each instrument used for analysis
Initial Calibration	Upon initial set up of each instrument, and each time continuing calibration fails to meet the acceptance criteria
Continuing Calibration	Every 12 hours for each instrument used for analysis
Internal Standards (trace volatiles, volatiles, and semivolatiles)	Added to each sample, standard, and blank
Matrix Spike and Matrix Spike Duplicate (MS/MSD)	Once every 20 or fewer samples of same fraction, matrix, and level in a Sample Delivery Group (SDG)
Laboratory Control Samples (LCSs) (pesticides and Aroclors)	Once every 20 or fewer samples of same fraction, matrix, and level in an SDG
Method Detection Limit (MDL)	Determined annually, per matrix and level

PERFORMANCE MONITORING ACTIVITIES

Laboratory performance monitoring activities are provided primarily by ASB and the Regions to ensure that contract laboratories are producing data of the appropriate quality. EPA performs on-site laboratory audits, data package audits, GC/MS and/or GC/ECD tape audits, and evaluates laboratory performance through the use of blind Performance Evaluation (PE) samples.

CONTACTING EPA

For more information, or for suggestions to improve this analytical service, please contact:

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Appendix F -
Contract Laboratory Program Organic and Inorganic Modified Analyses

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
1	The modification required the laboratory to spike each soil VOA and BNA sample with the set of DMCs that are used for aqueous samples under OLC03.2.	OLC03.2	Soil	VOA and BNA		X				
2	The modification required the laboratory to analyze samples for the same target analytes listed on page C-3, plus the one additional analyte, hexane (CAS 110543), with a CRQL of 0.5 ug/L.	OLC03.2	Water	VOA			X			
3	The modification required the laboratory to analyze aqueous OLC03.2 Pest/PCB samples at CRQLs that are one-half of those listed in Exhibit C.	OLC03.2	Water	PEST	X					
4	The modification required the laboratory to analyze soil Pest/PCB samples at CRQLs that are one-half of those listed in Exhibit C.	OLC03.2	Soil	PEST	X					
5	The modification required the laboratory to analyze samples for the same target analytes listed in Exhibit C, but at half the present CRQLs.	OLC03.2	Water	PEST	X					
6	For this project, no specific changes were made to the protocols for analyzing samples under the OLC03.2 SOW, however the laboratory was required to analyze a Laboratory Control Sample (LCS) for each SDG in the project.	OLC03.2	Water	VOA						X

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
7	The laboratory must analyze aqueous VOA samples as specified in SOW OLC03.2. All samples must be reported from an undiluted sample analysis. If the on-column concentration of any target compound in any sample exceeds the initial calibration range, a new aliquot must be diluted and analyzed. In the event that high concentration target compounds are anticipated, the laboratory shall analyze and report the results from a diluted sample analysis that keeps the concentration of the highest concentration target compound in the upper half of the calibration range, as required by the SOW.	OLC03.2	Water	VOA					X	
8	The modification required the laboratory to analyze aqueous BNA samples as specified in SOW OLC03.2. For any sample in which the concentration of Pentachlorophenol and any of the Polyaromatic Hydrocarbons (PAHs) is determined to be below the CRQL in the non-modified analysis, Single Ion Monitoring analysis shall be conducted.	OLC03.2	Water	BNA					X	

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
9	The modification required the laboratory to analyze aqueous BNA samples as specified in Exhibit D SVOA with no modification. For any sample in which the concentration of Pentachlorophenol is determined to be below the CRQL in the non-modified analysis, Single Ion Monitoring analysis shall be conducted. Some samples should only be analyzed for PCP via SIM.	OLC03.2	Water	BNA					X	
10	The modification required the laboratory to analyze samples for the target analytes listed in Exhibit C, plus the one additional semivolatile analyte, 2-chloro-6-fluorophenol (CAS 2040-90-6: Alfa product number: B23303). The laboratory shall strive to achieve as low of a CRQL as feasible.	OLC03.2	Water	BNA			X			
11	The modification required the laboratory to analyze samples for the same target analytes listed on page C-3, plus one additional analyte, 1,2,3-trichloropropane (CAS# 96-18-4). This analyte shall have a CRQL of 0.5 ug/L.	OLC03.2	Water	VOA			X			
12	The modification required the laboratory to analyze volatile samples for the target analytes listed on page C-5, plus two additional analytes, 1,4-Dioxane (CAS 123-91-1), with a required CRQL of 2.0 ug/L, and 1,4-Dioxane-d8 (CAS #17647-74-4) - (Aldrich catalogue number 18,640-6). The deuterated 1,4-dioxane is to be used as a surrogate compound for the volatile analysis.	OLC03.2	Water	VOA			X			

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
13	The modification required the laboratory to analyze samples for the same target analytes listed on page C-3, plus the one additional analyte, 1,4-Dioxane (CAS 123-91-1), with a required CRQL of 1.0 ug/L. Single ion monitoring techniques (SIM) are to be used for analysis.	OLC03.2	Water	VOA			X		X	
14	The modification required the laboratory to analyze samples for the same target analytes listed on page C-3, plus the one additional analyte, 1,4-Dioxane (CAS 123-91-1), with a required CRQL of 1.0 ug/L. Single ion monitoring techniques (SIM) are to be used for analysis. For each SDG in which at least one sample is analyzed for 1,4-Dioxane using the SIM technique, one laboratory control sample (LCS) shall be analyzed using the SIM technique.	OLC03.2	Water	VOA			X		X	
15	The modification required the laboratory to analyze samples for the same target analytes listed on page C-3, plus the one additional analyte, 1,4-Dioxane (CAS 123-91-1), with a required CRQL of 2.0 ug/L. Single ion monitoring techniques (SIM) are to be used for analysis. For each SDG in which at least one sample is analyzed for 1,4-Dioxane using the SIM technique, one laboratory control sample (LCS) shall be analyzed using the SIM technique.	OLC03.2	Water	VOA			X		X	

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
16	The modification required the laboratory to analyze samples for the same target analytes listed on page C-3, plus the one additional analyte, 1,4-Dioxane (CAS 123-91-1), with a required CRQL of 1.0 ug/L. Single ion monitoring techniques (SIM) are to be used for analysis. Additionally, the laboratory is to review the TIC analysis performed during the original Scan analysis. In particular, the Region is interested in an estimated value for 1,3-butadiene.	OLC03.2	Water	VOA			X		X	
17	The modification required the laboratory to analyze samples for the same target analytes listed on page C-3, with the following additional requirements: CRQLs for benzene shall be lowered to a CRQL of 0.2 ug/L (or lower if more convenient for the laboratory), and the CRQL for vinyl chloride shall be lowered to a CRQL of 0.18 ug/L (or lower if more convenient for the laboratory). The samples must be analyzed using a Selected Ion Monitoring (SIM) technique.	OLC03.2	Water	VOA	X				X	
18	The modification required the laboratory to analyze samples for the same target analytes listed in Exhibit C, but at lower CRQLs for Pentachlorophenol (CRQL to 1 ug/L or lower). To achieve this CRQL, a separate analytical run using Selected Ion Monitoring (SIM) technique will have to be used.	OLC03.2	Water	BNA	X				X	

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
19	The modification required the laboratory to analyze samples for the same target analytes listed in Exhibit C, but at lower CRQLs for Pentachlorophenol (CRQL to 1 ug/L or lower). To achieve this CRQL, a separate analytical run using Selected Ion Monitoring (SIM) technique had to be used. In addition, for each SDG in which at least one sample is analyzed for Pentachlorophenol using the SIM technique, one laboratory control sample (LCS) was analyzed using the SIM technique.	OLC03.2	Water	BNA	X				X	
20	The modification required the laboratory to analyze samples for the same target analytes listed in Exhibit C, but at lower CRQLs. For the volatile samples, all non-ketone analyte had a CRQL of 0.2 ug/L (Ketone analyte CRQLs will not change). For the semivolatile samples, all CRQLs remained the same except for Pentachlorophenol (changed from 5 ug/L to 1 ug/L). To achieve this CRQL, a separate analytical run using Selected Ion Monitoring (SIM) technique had to be used.	OLC03.2	Water	VOA and BNA	X				X	

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
21	The modification required the laboratory to analyze samples for the same target analytes listed in Exhibit C, but at lower CRQLs. For the volatile samples, all non-ketone analytes had a CRQL of 0.2 ug/L (Ketone analytes CRQLs will not change). For the semivolatile samples, all CRQLs remained the same except for Pentachlorophenol and Phenanthrene (changed from 5ug/L to 1 ug/L or lower). To achieve this CRQL, a separate analytical run using Selected Ion Monitoring (SIM) technique had to be used.	OLC03.2	Water	VOA and BNA	X				X	
22	The modification required the laboratory to analyze samples for the same target analytes listed on page C-3, with the following additional requirements: Tetrachloroethane (CRQL 5 ug/L), Trichloroethene (CRQL 5 ug/L), cis-1,2-Dichloroethere (CRQL 70 ug/L), trans-1,2 Dichloroethene (CRQL 100 ug/L), and Vinyl Chloride (CRQL 2 ug/L).	OLC03.2	Water	VOA	X					

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
23	The modification required the laboratory to analyze aqueous BNA and Pest/PCB samples as specified in SOW OLC03.2. Semivolatile sample extract will be analyzed in two phases; (1) by GC/MS scan technique following the unmodified Statement of Work, and (2) by GC/MS SIM technique following procedures described below. The SIM technique was to be used to achieve a CRQL of 0.04 for the following compounds: Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, and Dibenzo(a,h)anthracene. Pesticide/Aroclor analysis was to be performed as described in the unmodified Statement of Work, except that the CRQL for Aroclor 1221 was lowered from 0.4 ug/L to 0.2 ug/L.	OLC03.2	Water	BNA and PEST	X				X	
24	The proposed modification will require the laboratory to analyze samples for the same target analytes listed in Exhibit C, but at lower CRQLs. For the volatile samples, Trichloroethene had a CRQL of 0.20 ug/L, or lower, instead of 0.5 ug/L as written in Exhibit C and Vinyl Chloride had a CRQL of 0.40 ug/L, or lower, instead of 0.5 ug/L as written in Exhibit C. In addition, the adjusted CRQL for non-detected analytes could not exceed the levels identified.	OLC03.2	Water	VOA	X					

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
25	The modified analysis protocol involved two stages: (1) all samples were to first be analyzed according to Exhibit D/SVOA with no modification; and (2) all samples were then analyzed using Selected Ion Monitoring (SIM) protocol to achieve CRQLs consistent with the modified CRQLs and analyte list given.	OLC03.2	Water	VOA					X	
26	The modification required the laboratory to analyze for the same target analytes listed in Exhibit C, but with a 24-hour reporting requirement for preliminary results (full data package due within 7 days of receipt at laboratory).	OLC03.2	Water	VOA				X		
27	The modification required the laboratory to analyze aqueous VOA samples as specified in SOW OLC03.2. Three additional analytes, hexane, isopropanol, and 1,4-Dioxane, were added as target analytes at CRQLs of 0.5 ug/L, 25 ug/L, and 1.0 ug/L, respectively.	OLC03.2	Water	VOA			X		X	
28	The modification required the laboratory to analyze samples for the same target analytes listed on page C-3, with the following additional analytes: 1,1-dichloropropene (CAS # 563-58-6), 1,2,3-trichloropropane (CAS# 96-18-4), and 1,3-dichloropropane (CAS # 142-28-9). These analytes had a CRQL of 0.5 ug/L.	OLC03.2	Water	VOA			X			

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
29	The required modification is a revision of R9AD022603* that required the laboratory to analyze aqueous VOA samples as specified in SOW OLC03.2. The CRQL of 1,2-Dibromoethane was changed from 0.5 ug/L to 0.05 ug/L or lower. An additional analyte, 1,3-Dichlorpropane, was added as a target analyte with a CRQL of 0.5 ug/L. *See e-mail from Terry Smith*	OLC03.2	Water	VOA	X		X		X	
30	The modification required the laboratory to analyze aqueous VOA samples as specified in SOW OLC03.2. Two additional analytes, hexane and isopropanol was added as target analytes with CRQLs of 0.5 ug/L and 25 ug/L respectively.	OLC03.2	Water	VOA			X			
31	The modification required the laboratory to analyze aqueous VOA samples as specified in SOW OLC03.2. The following analytes were added to the target analyte list at a CRQL of 0.5 ug/L: 1,1-dichloropropene, 1,2,3-trichloropropane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1,3-dichloropropane, n-butylbenzene, n-propylbenzene, and sec-butylbenzene. In addition, the CRQL for 1,2-Dibromoethane was lowered to a CRQL of 0.05 ug/L, or lower. SIM analysis was required.	OLC03.2	Water	VOA	X		X		X	

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
32	The modification required the laboratory to analyze aqueous VOA and BNA samples as specified in SOW OLC03.2. For the VOA samples, the two additional analytes, 1,4-Dioxane (CRQL 1.0 ug/L) and 1,4-Dioxane-d8 (used as surrogate compound). For the BNA analysis, 1,4-Dioxane and the deuterated Dioxane were the only required analytes. SIMs were to be used for analysis. The semivolatile analysis was required to be performed in the scan mode.	OLC03.2	Water	VOA and BNA			X			
33	The modification required the laboratory to analyze samples for the same target analytes listed on page C-3, with the following additional requirements: 1) The CRQLs for the analytes 1,2,-Dibromoethane (CAS No. 106-93-4) and 1,2-Dibromo-3-Chloropropane (CAS No. 96-12-8) was lowered to a CRQL of 0.02 ug/L. 2) Eight additional analytes were added to the target analyte list: 1,1-dichloropropene (CAS # 563-58-6), 1,2,3-trichloropropane (CAS# 96-18-4), 1,2,4-trimethylbenzene (CAS # 95-63-6), 1,3,5 trimethylbenzene (CAS # 108-67-8), 1,3-dichloropropane (CAS # 142-28-9), n-butylbenzene (CAS # 104-51-8), n-propylbenzene (CAS # 103-65-1), and sec-butylbenzene (CAS # 135-98-8). All of these analytes had a CRQL of 0.5 ug/L with the exception of 1,2,3-trichloropropane, which shall have a required CRQL of 0.02 ug/L.	OLC03.2	Water	VOA	X		X			

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
34	The modification required the laboratory to analyze samples for the same target analytes listed on page C-3, with the following additional analytes: 1,2,3-trichloropropane (CAS# 96-18-4), and 1,3-dichloropropane (CAS # 142-28-9). These analytes had a CRQL of 0.5 ug/L.	OLC03.2	Water	VOA			X			
35	The modification required the laboratory to analyze aqueous VOA samples as specified in SOW OLC03.2. The CRQL of 1,2-Dibromoethane was changed from 0.5 ug/L to 0.10 ug/L or lower. An additional analyte, 1,3-Dichlorpropane, was added as a target analyte with a CRQL of 0.5 ug/L.	OLC03.2	Water	VOA	X		X			
36	The modification required the laboratory to analyze samples for the same target analytes listed in Exhibit C, plus the one additional volatile analyte, ethyl acetate (CAS 141-78-6), and one semivolatile analyte, toluene diisocyanate (CAS 584-84-9). The laboratory was required to establish a reasonable CRQL for each of these analytes, based upon the compound's efficiency by the appropriate method.	OLC03.2	Water	VOA and BNA			X			
37	The modification required the laboratory to analyze aqueous BNA samples as specified in SOW OLC03.2 with an additional compound, carbazole, added as a target compound at a CRQL of 5.0 ug/L.	OLC03.2	Water	BNA			X			

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
38	The modified analysis protocol required labs to also analyze each sample for the selected Polyaromatic Hydrocarbon (PAH) listed and Pentachlorophenol using Single Ion Monitoring (SIM) techniques.	OLC03.2	Water	BNA					X	
39	The modification required the laboratory to analyze samples for the same target analytes listed on page C-3, plus two additional analytes, 1,2,4-Trimethylbenzene (CAS 95-63-6), and 1,3,5-Trimethylbenzene (CAS 108-67-8). A CRQL of 0.5 ug/L was required for each analyte.	OLC03.2	Water	VOA			X			
40	The modified analysis protocol required labs to also analyze each sample for the target analytes listed in Exhibit C at the CRQLs as listed in Exhibit C, with the exception that Vinyl Chloride, Chloromethane, Bromomethane, Chloroethane, Trichlorofluoromethane, and Dichlorodifluoromethane be reported at CRQLs of 0.2 ug/L.	OLC03.2	Water	VOA	X					
41	The modification required the laboratory to analyze the aqueous phase of multiphase samples as specified in the SOW. Additionally, the BNA fraction of non-aqueous phase samples were required to be analyzed according to waste dilution protocols of SW 846. Acid cleanup was performed before the PEST fraction of the non-aqueous phase samples is analyzed according to the SOW.	OLM04.2	Multiphase	BNA and PEST		X			X	

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
42	The modified analysis protocol required the laboratory to analyze samples for the same target analytes listed on page C-3 of SOW OLM04.2, but at lower CRQLs. The modified CRQL for all non-ketone compounds was 0.5 ug/L. The CRQL for Acetone, 2-Butanone, 4-Methyl-2-pentanone, and 2-Hexanone remained at 10 ug/L.	OLM04.2	Water	VOA	X					
43	The modification required the laboratory to analyze samples for the same target analytes listed on page C-3, plus the one additional analyte, hexane (CAS 110543), with a CRQL of 10.0 ug/L.	OLM04.2	Water and Soil	VOA			X			
44	The modification required the laboratory to analyze samples for the same target analytes listed on page C-5, plus the two additional analytes, Mirex (CAS 2385855) and Kepone (CAS 143500). CRQLs of 330 ug/Kg were required for these analytes.	OLM04.2	Soil	BNA			X			
45	The modified analysis required the laboratory to perform the analysis as written in Exhibit D/SVOA with the exception that 50 grams of sample will be required instead of 30 grams as stipulated in Section 10.1.4.4.1 of Exhibit D/SVOA. The use of 50 grams of sodium sulfate lowered the CRQLs of each of the semivolatile analytes by a factor of approximately 1.67 (example Naphthalene changed from 330 ug/Kg to 200 ug/Kg).	OLM04.2	Soil	BNA	X					

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
46	The laboratory must analyze soil and water BNA samples as specified in the SOW. In addition, the modification required the laboratory to obtain a printout of the compound 1,2,3-trimethyl-4-propenyl-naphthalene and search the chromatogram for TIC compounds. Reporting procedures depended on if the compound was found to be present in the sample. In addition, the laboratory was required to perform a vender search for the compound.	OLM04.2	Soil and Water	BNA					X	
47	The modified analysis required the laboratory to (1) perform extraction process for oily waste samples using a procedure similar to the Waste Dilution protocol written in SW 846 Method 3580A, and (2) for both oily waste samples and soil samples, use an additional sample cleanup procedure similar to the sulfuric acid cleanup protocol written in SW 846 method 3665A.	OLM04.2	Oil waste and Soil	PEST					X	
48	The modified analysis required the laboratory to use a sample cleanup technique that follows the general guidelines for Sulfuric acid cleanup as presented in SW 846 method 3665A.	OLM04.2	Soil	PEST					X	

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
49	The modified analysis required the laboratory to use sample cleanup and analysis techniques not currently written into OLM04.2. The cleanup techniques to be used should generally follow guidelines for Silica Gel cleanup as presented in SW 846 Method 3630, followed by Sulfuric acid cleanup as presented in SW 846 method 3665A, and the analytical technique should generally follow PCB GC guidelines presented in SW 846 Method 8082.	OLM04.2	Soil	PEST					X	
50	The modification required the laboratory to analyze aqueous BNA samples as specified in SOW OLM04.2. For any sample in which the concentration of Pentachlorophenol and all of the Polyaromatic Hydrocarbon (PAH) is determined to be below the CRQL in the non-modified analysis, Single Ion Monitoring analysis shall be conducted.	OLM04.2	Water	BNA					X	
51	The modification required the laboratory to analyze samples for the target analytes listed in Exhibit C, plus the one additional semivolatile analyte, 2-chloro-6-fluorophenol (CAS 2040-90-6: Alfa product number: B23303). The laboratory shall strive to achieve as low of a CRQL as feasible.	OLM04.2	Soil and Water	BNA			X			

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
52	The modification required the laboratory to analyze samples for the target analytes listed in Exhibit C, plus two additional semivolatile analytes, Benzidine (CAS 92-87-5), and 1,2-Diphenylhydrazine (CAS 122-66-7). The laboratory should strive to reach CRQLs of 660 ug/kg for both analytes for the soil samples, and 10 ug/L for water samples.	OLM04.2	Soil and Water	BNA			X			
53	The modified analysis protocol required the laboratory to analyze samples for the same target analytes listed on page C-3, but at lower CRQLs and include Acetonitrile (CAS# 75-05-8) to the volatile target analyte list.	OLM04.2	Water	VOA	X		X			
54	The modification required the laboratory to analyze samples for the same target analytes listed in Exhibit C, plus the following additional compounds: 1,3,5-trichlorobenzene (CAS # 108-70-3), 1,2,3,4-tetrachlorobenzene (CAS # 634-66-2), 1,2,4,5-tetrachlorobenzene (CAS # 95-94-3), and pentachlorobenzene (CAS # 608-93-5). The CRQLs for each of these compounds shall be set a 10 ug/L for water samples, and 330 ug/Kg for soil samples. Preliminary results are to be provided, however only the standard Form I's for the original analytes are required to be reported in the 72 hour time frame.	OLM04.2	Soil and Water	BNA			X	X		

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
55	The modification required the laboratory to analyze samples for the same target analytes listed in Exhibit C, plus the following additional compounds: 1,3,5-trichlorobenzene (CAS # 108-70-3), 1,2,3,4-tetrachlorobenzene (CAS # 634-66-2), 1,2,4,5-tetrachlorobenzene (CAS # 95-94-3), and pentachlorobenzene (CAS # 608-93-5). The CRQLs for each of these compounds shall be set a 10 ug/L for water samples, and 330 ug/Kg for soil samples.	OLM04.2	Soil and Water	BNA			X			
56	The modification required the laboratory to analyze samples for the same target analytes listed in Exhibit C, plus the following additional compounds: 1,2,3-trichlorobenzene, 1,3,5-trichlorobenzene (CAS # 108-70-3), 1,2,3,4-tetrachlorobenzene (CAS # 634-66-2), 1,2,4,5-tetrachlorobenzene (CAS # 95-94-3), and pentachlorobenzene (CAS # 608-93-5). The CRQLs for each of these compounds shall be set a 10 ug/L for water samples, and 330 ug/Kg for soil samples.	OLM04.2	Water	BNA			X			
57	The modified analysis required the laboratory to use a sample cleanup technique that follows the general guidelines for Sulfuric acid cleanup as presented in SW 846 method 3665A. Only the listof Aroclors presented in Exhibit C, Section 3 is to be analyzed.	OLM04.2	Soil and Water	PEST				X	X	

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
58	The modified analysis required the laboratory to use a sample cleanup technique that follows the general guidelines for Sulfuric acid cleanup as presented in SW 846 method 3665A. Only the listof Aroclors presented in Exhibit C, Section 3 is to be analyzed.	OLM04.2	Soil	PEST					X	
59	The modified analysis required the laboratory to use a sample cleanup techniques that follow the guidelines for PCB analysis by SW 846 method 8082 and Sulfuric acid cleanup as presented in SW 846 method 3665A. Because this particular cleanup technique is destructive to certain pesticide compounds only the list of Aroclors presented in Exhibit C, Section 3 is to be analyzed and reported.	OLM04.2	Soil and Water	PEST					X	
60	The modified analysis required the laboratory to (1) perform extraction process for oily waste samples using a procedure similar to the Waste Dilution protocol written in SW 846 Method 3580A, and (2) for oily waste samples and soil samples use an additional sample cleanup procedure similar to the sulfuric acid cleanup protocol written in SW 846 method 3665A.	OLM04.2	Oil waste and Soil	PEST					X	

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
61	The modified analysis required the laboratory to use a sample cleanup techniques that follow the guidelines for PCB analysis by SW 846 method 8082 and Sulfuric acid cleanup as presented in SW 846 method 3665A. Because this particular cleanup technique is destructive to certain pesticide compounds only the list of Aroclors presented in Exhibit C, Section 3 is to be analyzed and reported. For QC purposes, the lab is to use an Aroclor mixture of 1016 and 1260 for Matrix spike and spike duplicate purposes. Required turnaround time is 14 days.	OLM04.2	Soil	PEST					X	
62	The modified analysis protocol involved two stages: (1) all samples shall first be analyzed according to Exhibit D/SVOA; and (2) all samples shall then be analyzed using Selected Ion Monitoring (SIM) protocol to achieve CRQLs consistent with the modified CRQLs and analyte list given.	OLM04.2	Soil and Water	BNA					X	
63	The modification required the laboratory to analyze samples for the target analytes listed on page C-8, with the exception that Aroclor -1268 (CAS # 11100144: order from Supelco, Sigma Aldrich, etc) will be substituted for Aroclor - 1221. The CRQL of Aroclor-1268 will be 33 ug/Kg for soil samples and 1.0 ug/L for water samples.	OLM04.2	Soil and Water	PEST			X			

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
64	The modified analysis required the laboratory to use a sample cleanup technique that is not currently written into OLM04.2. The cleanup technique to be used should follow the general guidelines for Sulfuric acid cleanup as presented in SW 846 method 3665A. This flexibility analysis is to be used in conjunction with the flexibility analysis under Reg4PCB120602 (i.e. aroclor 1268 is to be included as an analyte.).	OLM04.2	Water	PEST					X	
65	The modified analysis protocol involved two stages: (1) all samples shall first be analyzed according to Exhibit D/SVOA with no modification; and (2) for any sample in which the concentration of Pentachlorophenol and all of the Polyaromatic Hydrocarbon (PAH) is determined to be below the CRQL in the non-modified analysis, Single Ion Monitoring (SIM) analysis shall be conducted.	OLM04.2	Soil	BNA					X	
66	The modification required the laboratory to analyze samples for the same target analytes listed in Exhibit C, plus the one additional volatile analyte, Acrylonitrile (CAS 107-13-1).	OLM04.2	Soil	VOA			X			

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
67	The modified analysis protocol involved two stages: (1) all samples shall first be analyzed according to Exhibit D/SVOA with no modification, (2) for any sample in which the concentration of Pentachlorophenol and/or atrazine is determined to be below the CRQL in the non-modified analysis, Single Ion Monitoring (SIM) analysis shall be conducted.	OLM04.2	Soil	BNA					X	
68	The modified analysis protocol involved three stages: (1) all samples shall first be analyzed according to Exhibits D/SVOA. For this analysis, the following compounds are to be added to the analyte list: Pyridine (CAS # 110-86-1) Dibenzofuran (CAS # 132-64-9). (2) Samples are then to be analyzed with Selected Ion Monitoring protocol (SIM). The analytes that are required to be analyzed by the SIM protocol and the required CRQLS listed. (3) The laboratory is to pay special attention in the TIC review of the scan analysis for dimethylnaphthalenes.	OLM04.2	Soil	BNA	X		X		X	

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
69	The modification required the laboratory to analyze per the SOW with lowered maximum acceptable detection levels for Trichloroethene, Benzo (a) anthracene, Benzo (a) pyrene, Benzo (b) fluroranthene, Dibenzo (a,h) anthracene, Indeno (1,2,3-cd) pyrene and the CRQLs for non-detects shall not exceed the values identified for the soil VOA and BNA compounds indicated.	OLM04.2	Soil	VOA and BNA	X					
70	The laboratory was required to analyze soil BNA samples as specified in SOW OLM04.2. For any sample in which the concentration any of the Polyaromatic Hydrocarbon (PAH) analytes is determined to be below the CRQL in the *non-modified analysis*, Single Ion Monitoring analysis was conducted to achieve a lower CRQL (ug/Kg) for the following compounds: Benzo(a)anthracene (6200), Benzo(b)fluoranthene (6200), Benzo(a)pyrene (620), Dibenzo(a,h)anthracene (620), and Indeno(1,2,3-cd)pyrene (6200). All sample extracts were first analyzed according to Exhibit D/SVOA with no *modification*. In addition, for any sample in which the concentration of any of the target Polyaromatic Hydrocarbon (PAH) analytes was determined to be below the required CRQLs listed, Single Ion Monitoring (SIM) analysis was conducted in order to achieve the CRQLs.	OLM04.2	Soil	BNA	X				X	

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
71	The modified analysis protocol involved two stages: (1) all samples were first analyzed according to Exhibits D/SVOA, and (2) any sample analyzed by the GC/MS scan protocol in which any analyte from the list had a final calculated result qualified as a "U" (not-detected) or a "J" (detected at value below CRQL), and had an associated CRQL greater than the "Soil Protection" levels listed must be analyzed by Single Ion Monitoring techniques (SIM) in order to achieve the CRQL listed for the associated analyte.	OLM04.2	Soil	VOA and BNA					X	
72	The modified analysis protocol involved two stages: (1) all samples shall first be analyzed according to Exhibit D/SVOA, and (2) any sample analyzed by the GC/MS scan protocol in which any analyte from the list below has a final calculated result qualified as a "U" (not-detected) or a "J" (detected at value below CRQL), and the adjusted CRQL for that compound is greater than that listed below, must be re-analyzed by using a Single Ion Monitoring techniques (SIM) in order to achieve the desired CRQLs listed for the associated analyte.	OLM04.2	Unknown	BNA					X	

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
73	The modification required the laboratory to analyze soil and water BNA samples as specified in SOW OLC03.2. One additional analyte, Ametryne, will be added as target analyte at a CRQL of 330 ug/Kg for soil samples and 10 ug/L for water samples.	OLM04.2	Soil and Water	BNA			X			
74	The modification required the laboratory to analyze aqueous VOA samples as specified in SOW OLM04.2 at a volume of 25 mL of sample instead of the normal amount of 5 mL	OLM04.2	Water	VOA					X	
75	The modification required the laboratory to use a sample cleanup technique that is not currently written into OLM04.2 on soil Pest/PCB samples. The cleanup technique to be used should follow the general guidelines for Sulfuric acid cleanup as presented in SW 846 method 3665A. Because this particular cleanup technique is destructive to certain pesticide compounds that are target analytes of OLM04.2, only the list of Aroclors presented in Exhibit C, Section 3 is to be analyzed and reported.	OLM04.2	Soil	PEST/PCBs					X	

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
76	The modification required the laboratory to analyze samples for the same target analytes listed in Exhibit C, plus the one additional volatile analyte, ethyl acetate (CAS 141-78-6), and one semivolatile analyte, toluene di-isocyanate (CAS 584-84-9). The laboratory is to establish a reasonable CRQL for each of these analytes, based upon the compound's efficiency by the appropriate method.	OLM04.2	Soil	VOA and BNA			X			
77	The modified analysis protocol required labs to analyze for Pentachlorophenol and all of the Polyaromatic Hydrocarbon (PAH) listed in Exhibit C using Single Ion Monitoring (SIM) techniques.	OLM04.2	Soil	BNA					X	

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
78	The modified analysis protocol involved two stages: (1) all samples shall first be analyzed according to Exhibit D/SVOA with no modification; and (2) any sample analyzed by the non-modified protocol, in which the adjusted CRQL for any of the specified Polyaromatic Hydrocarbons (PAH) is greater than its associated maximum CRQL, must be analyzed by Single Ion Monitoring techniques. Compounds include Naphthalene, 2-Methylnaphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(a)pyrene, Dibenzo(a,h)anthracene, Benzo(b)fluoranthene, Indeno (1,2,3 cd) pyrene, Benzo (k) fluoranthene which have a Maximum Adjusted CRQL of 500 ug/Kg.	OLM04.2	Soil	BNA	X				X	

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
79	The modification required the laboratory to analyze soil and rinsate BNA samples as outlined in Exhibit D/SVOA with the only modification being that the compound 1-Methylnaphthalene (CAS# 90-12-0) be added as a target analyte (to be analyzed by GC/MS scan mode), and any sample analyzed by GC/MS scan protocol in which any analyte in the specified list has a final calculated result qualified as "U" or "J" must be analyzed by SIM techniques in order to achieve the specified CRQL for the associated analyte.	OLM04.2	Soil and Water	BNA			X		X	
80	The modification required the laboratory to analyze soil BNA samples under the protocol outlined in OLM04.2 Exhibit D. The proposed modification will also require labs to also analyze each sample for the for the target Polyaromatic Hydrocarbon (PAH) listed in Exhibit C using SIM techniques.	OLM04.2	Soil	BNA					X	

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
81	The modified analysis protocol required labs to also analyze each sample for the target Polyaromatic Hydrocarbon (PAH) and phenolic compounds listed below using Single Ion Monitoring (SIM) techniques. Each sample will at least have a full scan analysis made following the exact protocol outlined by the OLM04.2 SOW. Any sample containing all of the target SIM compounds at levels equal to or greater than 330 ug/Kg , or any individual SIM compound at a level greater than 1700 ug/Kg will not need to be further analyzed by the SIM protocol.	OLM04.2	Soil	BNA					X	
82	The modification required the laboratory to analyze samples for the same target analytes listed in Exhibit C, plus the one additional analyte, Ametryne (CAS 834-12-8), with a CRQL of 10.0 ug/L.	OLM04.2	Soil and Water	BNA			X			
83	The modification required the laboratory to analyze samples for the same target analytes listed in Exhibit C, plus the one additional volatile analyte, Tetrahydrofuran (CAS 109-99-9). This additional analyte is to be analyzed down to a CRQL of 50.0 ug/L.	OLM04.3	Water	VOA			X			

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
84	The modification required the laboratory to analyze samples using the current OLM04.3 GC/MS scan technique for semivolatile analytes (with a few minor modifications), and also to analyze the samples for PAH analytes using the Selected Ion Monitoring technique (SIM).	OLM04.3	Water	BNA	X				X	
85	The modification required the laboratory to analyze samples for the same target analytes listed in Exhibit C, plus the following additional compounds: 2,6-dimethylphenol, CAS Number: 576-26-1; 3,4-dimethylphenol, CAS Number: 95-65-8; and 2,3,5,6-tetrachlorophenol, CAS Number: 935-95-5 (with CRQLS $\leq$ 25 ug/L). In addition, the laboratory will analyze and report Pentachlorophenol with a CRQL of 10 ug/L instead of 25 ug/L, add 2,6-dimethylphenol, 3,4-dimethylphenol, and 2,3,5,6-tetrachlorophenol as additional matrix spike and matrix spike duplicate analytes, and prepare and analyze a laboratory fortified blank containing pentachlorophenol at 10 ug/L.	OLM04.3	Water	BNA	X		X			

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
86	The modification required the laboratory to analyze samples for select PAH compounds. In addition, sample extracts shall be processed through an extra cleanup step involving the use of Silica Gel as a cleanup median. CRQLs lower than those shown in Exhibit C will be required, therefore, the sample extracts must be analyzed using the Selected Ion Monitoring technique (SIM).	OLM04.3	Soil and Water	BNA	X				X	
87	The modification required the laboratory to analyze aqueous VOA samples as specified in SOW OLM04.3 with one additional analyte: 1,2,3-trichloropropane (CAS# 96-18-4) added to the target analyte list. This analyte shall have a CRQL of 10 ug/Kg for the soil samples, and 10 ug/L for the water samples.	OLM04.3	Soil and Water	VOA			X			
88	The modification required the laboratory to analyze samples for the target analytes listed in Exhibit C, with the following exceptions: • Methyl methacrylate (CAS 80-62-6) shall be added to the target analyte list. • The mandatory CRQLs listed in Exhibit C are waived to take into account the fact that the sample matrix will be assumed to be high concentration drum liquids. • One additional copy of the entire data deliverables shall be sent to the QATS contractor for a further detailed review of TIC components.	OLM04.3	Soil - Drum Liquid	VOA		X	X			X

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
89	The modification required the laboratory to analyze samples for the target analytes listed in Exhibit C, but with lower CRQLs for Trichloroethene (CRQL of 1 ug/Kg). This required CRQL is based on a wet weight basis (i.e., they are not corrected for moisture content). For each sample that does not contain Trichloroethene at a concentration level greater than 5 ug/Kg, the sample shall be re-analyzed as a separate billable sample using the SIM technique.	OLM04.3	Soil and Water	VOA	X				X	
90	The modification required the laboratory to analyze samples for the target analytes listed in Exhibit C, but with lower CRQLs for Trichloroethene (CRQL of 1 ug/Kg). This required CRQL is based on a wet weight basis (i.e., they are not corrected for moisture content). For each sample that does not contain Trichloroethene at a concentration level greater than 5 ug/Kg, the sample shall be re-analyzed as a separate billable sample using the SIM technique.	OLM04.3	Soil	VOA	X				X	
91	The modification required the Laboratory to analyze samples for the same target analytes listed in Exhibit C, plus an additional three pesticide compounds: 2,4' - DDD (CAS # 53-19-0), 2,4' - DDE (CAS # 3424-82-6), and 2,4' - DDT (CAS# 789-02-6). These are to be analyzed at the same CRQL as the 4,4' - form of each, DDD, DDE, and DDT.	OLM04.3	Soil and Water	PEST			X			

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
92	The modification required the laboratory to analyze samples for the same target analytes listed in Exhibit C, plus the following additional VOA compounds: 1,3-dichloropropane (CAS # 142-28-9), 1,2,3-trichlorobenzene, and the following additional BNA compounds: 1,3,5-trichlorobenzene (CAS # 108-70-3), 1,2,3,4-tetrachlorobenzene (CAS # 634-66-2), 1,2,4,5-tetrachlorobenzene (CAS # 95-94-3), and pentachlorobenzene (CAS # 608-93-5). The CRQLs for each of these compounds shall be set a 10 ug/L.	OLM04.3	Water	VOA and BNA			X			
93	The modified analysis protocol involved two stages: (1) all samples shall first be analyzed according to Exhibit D/SVOA with no modification; and (2) for any sample in which the concentration of Benzo(a) pyrene is determined to be not detected, or below the adjusted CRQL in the original analysis, must be re-analyzed by the Selected Ion Monitoring (SIM) technique (described below) in such a manner as to achieve an adjusted CRQL of 100 ug/Kg or lower for this one PAH compound.	OLM04.3	Soil	BNA					X	
94	The modification required the laboratory to analyze samples for the target analytes listed on page C-8, and to analyze for twelve additional Polychlorinated Biphenyl congeners:	OLM04.3	Soil and Water	PEST			X			

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
95	The modification required the laboratory to analyze samples for the target analytes listed on page C-8, with the exception that Aroclor-1268 (CAS # 11100144: order from Supelco, Sigma Aldrich, etc) will be added as an extra analyte. The CRQL for Aroclor 1268 will be 33 ug/Kg for soil samples and 1.0 ug/L for water samples.	OLM04.3	Soil and Water	PEST			X			
96	The modification required the lab to use fish preparation and blending techniques to process fish tissue for BNA and Pest analytical analyses under OLM04.3. Samples shall require both full scan analysis for BNA TCLs and CRQLs and SIM for PAHs. For Pest analysis, three compounds are to be analyzed: DDT, DDD, and DDE.	OLM04.3	Fish	BNA and PEST		X			X	
97	The modification required the laboratory to analyze and report the samples indicated for BNA analysis on the TR/COC for a select group of SVOC PAH compounds and their associated CRQLs.	OLM04.3	Soil	BNA			X			

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
98	This modified analysis was intended for specific Polyaromatic Hydrocarbon (PAH) compounds with the corrected CRQL kept below the following levels: Benzo(a) anthracene (5600 ug/Kg), Benzo(b) fluoranthene (5700 ug/Kg), Benzo(a) pyrene (560 ug/Kg), and Dibenzo(a,h) anthracene (550 ug/Kg). All sample extracts shall first be analyzed according to Exhibit D/SVOA with no modification. For any sample in which the concentration of any of the target PAH compounds listed below is determined to be not detected, or detected and "J flagged" below the adjusted CRQLs, and the adjusted CRQL is above that listed below, then Single Ion Monitoring (SIM) analysis shall be conducted on the extracts in order to achieve the necessary CRQLs.	OLM04.3	Soil	BNA	X				X	
99	The modification required the laboratory to analyze volatile samples for the target analytes listed in Exhibit C, plus two additional analytes, 1,4-Dioxane (CAS 123-91-1), with a required CRQL of 2.0 ug/L, and 1,4-Dioxane-d8 (CAS #17647-74-4) - (Aldrich catalogue number 18,640-6). The deuterated 1,4-dioxane is to be used as a surrogate compound for the volatile analysis. SIM techniques are to be used for analysis.	OLM04.3	Water	VOA			X		X	

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
100	The modified analysis protocol involved two stages: (1) all samples shall first be analyzed according to Exhibit D/SVOA with no modification; and (2) all samples shall then be analyzed using Selected Ion Monitoring (SIM) protocol to achieve CRQLs consistent with the modified CRQLs and analyte list given.	OLM04.3	Soil	BNA					X	
101	The modification required the laboratory to analyze samples for the same target analytes listed on in Exhibit C, plus three additional analytes, (1) hexane (CAS 110543), with a required CRQL of 2.5 ug/Kg , (2) isopropanol (CAS 67-63-0), with a required CRQL of 125 ug/Kg, and(3) 1,4-Dioxane (CAS 123-91-1), with a required CRQL of 5.0 ug/Kg.	OLM04.3	Soil	VOA			X			
102	The modification will require the laboratory to analyze samples for the same target analytes listed on page C-5, plus the one additional analyte, Retene (CAS 483658). CRQLs of 10.0 ug/L, and 330 ug/Kg will be required for this analyte for water samples and soil samples respectively.	OLM04.3	Soil and Water	BNA			X			

CLP Organic Modified Analyses

Organic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) Affected	Fraction(s) Affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
103	OLM04.3 - For soil samples, the laboratory analyzed BNA samples for all analytes listed in the SOW with one additional compound, Quinoline (CAS # 91-22-5) with a CRQL of 160 ug/Kg. For some soil samples, the laboratory analyzed BNA samples for Pentachlorophenol only. For soil Pesticide/PCB samples, the lab only analyzed for and reported results for the following compounds: DDT, DDD, and DDE. The remaining pesticide compounds, and PCBs were not to be reported.. OLC03.2 - For water samples, the laboratory analyzed the samples per the SOW with lower CRQLs for some analytes. For water Pesticide/PCB samples, the laboratory analyzed samples per the SOW except that only the PCB analytes are to be reported on Form 1.	OLM04.3 and OLC03.2	Soil and Water	BNA and PEST	X		X			

CLP Inorganic Modified Analyses

Inorganic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) affected	Fraction(s) affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
1	The modification required the laboratory to analyze wipe metal samples as specified in ILM04.1 for Pb only.	ILM04.1	Wipes	Total Metals		X				
2	The laboratory shall analyze Total Metals/Cyanide samples as specified in SOW ILM04.1. The modification required the laboratory to have the following analytes analyzed at the following CRQLs (or lower): Antimony (2.5 mg/kg), Chromium (0.2 mg/kg), Selenium (0.4 mg/kg), Thallium (0.4 mg/kg), and Vanadium (0.2 mg/kg). In addition, one additional analyte, Molybdenum, was analyzed at a CRQL of 1 mg/kg.	ILM04.1	Soil	Total Metals	X		X			
3	The modified analysis required the laboratory to analyze soil and water samples as specified in SOW ILM05.2 ICP-AES. An additional analyte, Strontium, was added as a target analyte with a CRQL of 20 ug/L for water samples and 4 mg/Kg for soil samples.	ILM05.2 ICP-AES	Soil and Water	Total Metals			X			

CLP Inorganic Modified Analyses

Inorganic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) affected	Fraction(s) affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
4	The modification required the laboratory to analyze water samples for Ca, Fe, Mg, K, and Na, using the following CRQLs: Ca 0.2 mg/L; Mg 0.2 mg/L; K 0.5 mg/L; Na 0.5 mg/L. The laboratory also analyzed for an additional analyte Boron (B, CASRN 7440-42-8) with a CRQL of 7.0 µg/L. The laboratory was required to submit Method Detection Limits for these analytes that are less than one-half the CRQLs.	ILM05.2 ICP-AES	Water	Total Metals	X		X			
5	The modification required the laboratory to analyze soil and water samples as specified in SOW ILM05.2 ICP-AES with an additional analyte, Molybdenum, added as a target analyte. The CRQL for water samples was 20 ug/L and 5 mg/Kg for soil samples.	ILM05.2 ICP-AES	Soil and Water	Total Metals			X			
6	The modification required the laboratory to analyze samples as specified in ILM05.2 ICP-AES with an additional analyte, Sulfur, added to the target compound list with a CRQL of 1 mg/L.	ILM05.2 ICP-AES	Water	Total Metals			X			

CLP Inorganic Modified Analyses

Inorganic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) affected	Fraction(s) affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
7	The modification required the laboratory to extract samples by method SW-846 1311 [Toxicity Characteristic Leaching Procedure (TCLP)] and analyze extracts for Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, and Silver by ICP-AES. For ICP-AES, digest extracts by preparation methods HW1 or MW1. Analyze extracts for Mercury by CVAA.	ILM05.2 ICP-AES	Soil	Total Metals and Mercury		X			X	
8	The modification required the laboratory to add Titanium [Ti, CASRN 7440-32-6] to the Target Analyte List for ICP-AES analysis (CRQL for Ti: 100 µg/L for water samples, 20 mg/kg for soil samples). Submit Method Detection Limits for water and soil preparation methods that are less than one-half the CRQL for the matrix.	ILM05.2 ICP-AES	Soil and Water	Total Metals			X			
9	The modification required the laboratory to analyze wipe samples as specified in ILM05.2 ICP-AES for Cadmium and Chromium only.	ILM05.2 ICP-AES	Wipe	Total Metals		X				
10	The modification required the laboratory to analyze aqueous metal samples as specified in ILM05.2 ICP-MS with four additional analytes: Lithium (CRQL of 5.0 ug/L); Molybdenum (CRQL of 2.0 ug/L); Strontium (CRQL of 2.0 ug/L); and Uranium (CRQL of 1.0 ug/L).	ILM05.2 ICP-MS	Water	Total Metals			X			

CLP Inorganic Modified Analyses

Inorganic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) affected	Fraction(s) affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
11	The modification required the laboratory to analyze soil samples as specified in ILM05.2 ICP-MS with a lowered CRQL for Tl of 0.1 mg/kg.	ILM05.2 ICP-MS	Soil	Total Metals	X	X				
12	The modification required the lab to use fish preparation and blending techniques to process fish tissue for analytical analyses under ILM05.3 ICP-MS. The samples were analyzed for eight target analytes (As, Ba, Cd, Cr, Cu, Pb, Se, and Ag) and Hg. The laboratory was also required to determine and calculate lipid content as per normally established protocol.	ILM05.2 ICP-MS	Fish	Total Metals		X			X	
13	The modification required the laboratory to analyze aqueous samples for lead as specified in ILM05.2 ICP-MS but with a CRQL of 0.5 ug/L instead of 1.0 ug/L. An additional analyze, sodium, was added as a target compound with a CRQL of 200 ug/L.	ILM05.2 ICP-MS	Water	Total Metals	X		X			
14	The modification required the laboratory to analyze Total Metal/Cyanide samples as specified in SOW ILM05.2 under ICP-MS at or below the following CRQLs: Arsenic (0.045 ug/L), Barium (4 ug/L), Cadmium (0.6 ug/L), and Silver (0.8 ug/L). In addition, one additional analyte, Molybdenum, was analyzed at a CRQL of 180 ug/L.	ILM05.2 ICP-MS	Water	Total Metals	X		X			

CLP Inorganic Modified Analyses

Inorganic Flex Clause Number	Summary	CLP Analytical Program	Matrix(s) affected	Fraction(s) affected	Adjusted Detect. Limit	Non-Routine Matrix	Additional or Different Compounds	Faster Turnaround	Non-CLP Protocol	Other
15	The laboratory must analyze soil and water metal samples as specified in ILM05.3 ICP-AES. The modification required the laboratory to have an acceptance window for target analytes for the ICSA analysis at +/- 10% of the true value for the analyte or CRQL, whichever is greater. The laboratory was required to adjust the instrument IECs to achieve these acceptance windows.	ILM05.3 ICP-AES	Soil and Water	Total Metals						X
16	The modification required the laboratory to analyze aqueous metal samples as specified in ILM05.3 ICP-AES with two additional analytes, Boron and Molybdenum, added as target analytes with CRQLs of 100 ug/L and 1 ug/L, respectively.	ILM05.3 ICP-AES	Water	Total Metals			X			
17	The modification required the laboratory to analyze aqueous metal samples as specified in ILM05.3 ICP-AES for TAL Metals and Mercury with lower CRQLs for Iron (30 ug/L) and Manganese (10 ug/L).	ILM05.3 ICP-AES	Water	Total Metals	X					

Appendix G -
Examples of Forms II and III of a Contract Laboratory Program data package

2A - FORM II VOA-1
WATER VOLATILE DEUTERATED MONITORING COMPOUND RECOVERY

Lab Name: A4 SCIENTIFIC, INC. Contract: EPW05036

Lab Code: A4 Case No.: 36525 Mod. Ref No.: ______ SDG No.: F2ES1

Level: (TRACE or LOW) TRACE

	EPA SAMPLE NO.	VDMC1 (VCL) #	VDMC2 (CLA) #	VDMC3 (DCE) #	VDMC4 (BUT) #	VDMC5 (CLF) #	VDMC6 (DCA) #	VDMC7 (BEN) #
01	F2ES1	127	121	93	110	111	109	113
02	F2ES2	125	119	90	103	110	109	113
03	F2ES8	125	119	89	99	108	107	111
04	F2ES9	124	120	90	98	106	105	112
05	F2ET6	121	121	89	112	108	113	112
06	F2EW1	126	122	91	93	106	100	112
07	F2EW2	132 *	125	95	117	115	115	113
08	F2EW2MS	122	117	110 *	111	106	109	111
09	F2EW2MSD	124	119	115 *	118	111	112	112
10	VBLK05	122	115	89	97	107	104	108
11	VBLK06	117	116	87	108	105	106	110
12	VHBLK01	123	119	91	107	108	109	115
13								
14								
15								
16								
17								
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19								
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23								
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26								
27								
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29								
30								

		QC LIMITS
VDMC1 (VCL)	= Vinyl chloride-d3	(65-131)
VDMC2 (CLA)	= Chloroethane-d5	(71-131)
VDMC3 (DCE)	= 1,1-Dichloroethene-d2	(55-104)
VDMC4 (BUT)	= 2-Butanone-d5	(49-155)
VDMC5 (CLF)	= Chloroform-d	(78-121)
VDMC6 (DCA)	= 1,2-Dichloroethane-d4	(78-129)
VDMC7 (BEN)	= Benzene-d6	(77-124)

Column to be used to flag recovery values
* Value outside of contract required QC limits

Page 1 of 1

3A - FORM III VOA-1
WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: A4 SCIENTIFIC, INC. Contract: EPW05036

Lab Code: A4 Case No.: 36525 Mod. Ref No.: ______ SDG No.: F2ES1

Matrix Spike - EPA Sample No.: F2EW2 Level: (TRACE or LOW) TRACE

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS %REC #	QC LIMITS REC.
1,1-Dichloroethene	5.0	0.0	3.9	77	61-145
Benzene	5.0	0.0	4.2	84	76-127
Trichloroethene	5.0	0.0	4.1	83	71-120
Toluene	5.0	0.0	4.1	82	76-125
Chlorobenzene	5.0	0.0	4.0	81	75-130

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD %REC #	%RPD #	QC LIMITS	
					RPD	REC.
1,1-Dichloroethene	5.0	4.3	86	11	0-14	61-145
Benzene	5.0	4.5	90	6	0-11	76-127
Trichloroethene	5.0	4.4	88	6	0-14	71-120
Toluene	5.0	4.3	87	6	0-13	76-125
Chlorobenzene	5.0	4.2	84	4	0-13	75-130

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

COMMENTS: ______

Appendix H –
Example of a Work Plan Sample Rationale

Proposed Samples to be Collected

Sample Matrix	Sample ID	Sample Location	Parameters	Rationale
Ground Water	GW-01	Pelican Bay PWS Well #2, 1150 Pelican Dr. S.	All	Assess potential groundwater contamination in PWS well.
	GW-02	Pelican Bay PWS Well #1, 1517 Long Ave.	All	Assess potential groundwater contamination in PWS well.
	GW-03	Pelican Bay PWS Well #11, 1653 Jason Ct.	All	Assess potential groundwater contamination in PWS well.
	GW-04	Pelican Bay PWS Well #12, 1653 Jason Ct.	All	Assess potential groundwater contamination in PWS well.
	GW-05	Pelican Bay PWS Well #13, 1653 Jason Ct. (QA/QC)	All	Assess potential groundwater contamination, extra volume for MS/MSD.
	GW-06	1713 Pelican Oval	All	Assess potential groundwater contamination in private well.
	GW-07	2921 Pelican Drive	All	Background groundwater sample from Paluxy Formation, private well.
	GW-08	1723 Pelican Oval	All	Assess potential groundwater contamination in private well.
	GW-09	Quality Assurance/Quality Control (QA/QC)	All	Duplicate sample collected at the same location as GW-08.
	GW-10	Quality Assurance/Quality Control (QA/QC)	Volatile organics	Field blank for groundwater matrix, collected at same location as GW-06.
	GW-11	Well sample collected at Camp Timberlake PWS Well #3	All	Background groundwater sample from Twin Mountains Formation, PWS well.

Sample Containers, Methods, Preservatives, and Holding Times for Aqueous Samples

Parameters	Sample Container	Preservative	Holding Time
Volatile organics	Two 40-ml wide mouth glass vials with Teflon-lined septa	HCl to pH<2, Cool to 4°C	7 days
Semivolatile organics, pesticides, PCBs	Two 1-liter amber glass bottles with Teflon-lined lids	Cool to 4°C	7 days for extraction, 40 days for analysis
Metals	Two 1-liter polyethylene bottles with Teflon-lined lids	HNO_3 to pH<2, Cool to 4°C	6 months
Cyanide	Two 1-liter polyethylene bottles with Teflon-lined lids	NaOH to pH>12, Cool to 4°C	14 days

* Reference: EPA Contract Laboratory Program Statement of Work for Organics Analysis, OLC03.2, (June 2001) and Statement of Work for Inorganic Analysis, ILM05.4 (December 2006).

Appendix I –
Example of a Data Assessment Report

Example Format
Data Assessment Report

Site Name
Number of samples collected and matrix type

Laboratories:

Quality Assurance/Quality Control (QA/QC) Review

Pursuant to the Quality Assurance Project Plan (QAPP) for the TCEQ Preliminary Assessment/Site Inspection Program (FY07), the TCEQ has reviewed the inorganic and organic analyses and the ESAT data validation reports, and concurs (does not concur) with the ESAT assessments. TCEQ has further assessed the usability of the data for Superfund decision-making, including the scoring of this site. *The review of each Sample Delivery Group can consider, as necessary, the following elements. A written report of the review will include only those elements for which a description of findings is necessary to explain deleterious findings regarding data usability.*

Sample Delivery Group Fxxx

Holding Times

Sample Preservation

Tuning/Performance

Calibrations

Blanks

System Monitoring Compounds (SMC's)/Surrogates

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Other QC

Internal Standards (IS)

Precision/Accuracy/Representativeness/Completeness

Overall Assessment

APPENDIX C

Site Reconnaissance Checklist

PRELIMINARY ASSESSMENT/SITE INSPECTION RECONNAISSANCE CHECKLIST

I. General
1. Name and title of site contact. RUDY KAGLE PUBLIC WORKS
2. Telephone number. 817/441-2858
3. Site address. 117 CIRCLE CT
4. Mailing address (if different). –
5. Name of owner and/or operator. WP (City of)
6. Mailing address. 516 Ranch House Rd 76087
7. GPS latitude and longitude (decimal degrees) – entrance to the site, center of site

II. Site History
1. How long has current owner/operator been at site?
2. What were previous uses of site? Who were previous owners? Willow Springs Oaks water system
3. Size of site (acres).
4. Is any other property used that is not contiguous with site? other pump station
5. Permits (RCRA, TDH, etc.) PBR
6. Any past spills or other environmental or accident problems. —
7. What were previous waste management practices? —

III. Current Operations
1. What is currently being done at facility? Active PWS
2. What are waste management practices? –
3. What are hazardous chemical management practices? Well, 2 GSTs
4. List major hazardous chemicals/constituents present and past. 3 S/Ps
5. Discuss sources (e.g., tanks, impoundments, containers, etc.).
6. Number of employees - current, peak. 10 - 12

IV. Source Characteristics N/A
1. Identify type of wastes and quantities disposed of at site.
   a. Identify source of information.
   b. Photograph.
   c. Dimension (quantity, volume, area) of waste locations.
   d. Containment controls (clay cap, clay liner, vegetative cover, etc.)
   e. Existing data.
   f. Condition/integrity of storage/disposal units.

VII. Soil Exposure Pathway locked fence

1. Describe status of site access, fencing, gates, locks, condition of security controls.
2. Describe adjacent land use. residential
3. Describe off-site runoff patterns. W → E/SE
4. Describe number of people with residence, school, or day care on-site or within 200 yds.
5. Locate nearest school or day care. ✓
6. Number of workers on-site (include maximum number to cover work on-site).
7. Evidence of recent human activity at the site.
8. Identify sensitive environments, (see list end of checklist).
9. Describe any off-site runoff pattern existing at the site.

VIII. Air Pathway

1. Estimate number of people within 4 miles (city or county records).
   a. 0 - 0.25 mile
   b. 0.25 - 0.50 mile
   c. 0.50 - 1.00 mile
   d. 1.00 - 2.00 mile
   e. 2.00 - 3.00 mile
   f. 3.00 - 4.00 mile
2. Shortest distance from source to occupied building.
3. Identify known releases to air.
4. Identify reports of adverse health effects.
5. Identify existence of sensitive environments within 4 miles (see end of checklist for list).

Miscellaneous Inquiries

1. Are any additional aerial photographs depicting site history available?
2. Meteorological data.
3. Nearest recreational area? Hospital?
4. Local water supply sources?

Site Sketches to Include

1. Date(s) of visit.
2. Well locations (including nearest to site) – wellhead, faucet, storage tank
3. Storage areas (past and present).
4. UST and above ground storage tanks.
5. Waste Areas.
6. Buildings
7. Access roads.
8. Areas of ponded water, or depressions in surface.
9. Drainage direction.
10. Photograph locations and directions.
11. Vegetation and significant landscaped features.
12. Any irregular appearance for soil, vegetation, tanks, etc. such as may result from spill, backfill operation, recent dirt moving work, etc.

V. Groundwater Pathway

1. Distance from source to nearest well. Identify name and address of well owner, if possible - and estimate well usage (number of people served, irrigation, supplemental, etc.).
2. Verify wells within range of site. Indicate depth to water for each well and number of people served. Identify as many owners and addresses as practically feasible.
   a. 0 - 0.25 mile
   b. 0.25 - 0.50 mile
   c. 0.50 - 1.00 mile
   d. 1.00 - 2.00 mile
   e. 2.00 - 3.00 mile
   f. 3.00 - 4.00 mile
3. Aquifer nearest wells are screened in, and water quality.

VI. Surface Water Pathway

1. Identify the TNRCC Basin and Stream Segment where the site is located.
2. Describe surface water quality including:
   a. average discharge,
   b. total basin drainage area,
   c. TNRCC surface water quality monitoring stations.
3. Are there surface water bodies within 2 miles of site?
4. Provide sketch of surface water runoff and flow patterns for 15 stream-miles downstream.
5. Identify intakes along surface water route within 15 stream-miles downstream.
6. What is water use at each intake.
7. Identify fisheries along the 15 stream-mile downstream pathway.
8. Identify sensitive environments along the 15 stream-mile downstream pathway (see attached list).
9. Identify downstream recreational uses.
10. Estimate approximate flow rates for each water body within the 15 stream-mile target distance (i.e., <10 cfs, 10-100 cfs, 100-1,000 cfs, 1,000- 10,000 cfs, etc.). Estimate length of each stream segment.
11. Identify the annual rainfall and net rainfall at the site.
12. Is site in flood plain (10 year, 100 year, 500 year)?
13. Estimate upgradient drainage area limits (watershed).
14. Draw a sketch of drainage from site to nearest surface water including any other contributing tributaries.
15. Identify recreational uses downstream (15 miles).

APPENDIX D

Preliminary Assessment Report

Preliminary Assessment Report

Circle Court Ground Water
117 Circle Court
Willow Park, Parker County, TX

TXN000606965

REGION VI

Prepared in cooperation with the
U.S. Environmental Protection Agency

March 2009

PRELIMINARY ASSESSMENT REPORT

CIRCLE COURT GROUND WATER
WILLOW PARK, PARKER COUNTY, TEXAS
TXN000606965

SIGNATURE PAGE

Nancy Johnson, PA/SI Project Manager
Texas Commission on Environmental Quality

05/06/2009
Date

Marshall Cedilote, PA/SI Program Manager
Texas Commission on Environmental Quality

5/6/09
Date

Bret Kendrick
U.S. Environmental Protection Agency

Date

PRELIMINARY ASSESSMENT REPORT

CIRCLE COURT GROUND WATER
WILLOW PARK, PARKER COUNTY, TEXAS
TXN000606965

Prepared in cooperation with the

Texas Commission on Environmental Quality
and
U.S. Environmental Protection Agency

Prepared by

Texas Commission on Environmental Quality
Austin, Texas

March 2009

The preparation of this report was financed through grants from the U.S. Environmental Protection Agency and administered through the Texas Commission on Environmental Quality.

NOTE

The State predecessor agencies: Texas Water Quality Board (TWQB), Texas Department of Water Resources (TDWR), Texas Water Commission (TWC), Texas Air Control Board (TACB) and Texas Natural Resources Conservation Commission (TNRCC) referred to throughout this report are now known as the Texas Commission on Environmental Quality. The new agency, TCEQ, became effective September 1, 2002, as mandated under State House Bill No. 2912 of the 77th Regular Legislative Session.

PROJECT CONTACTS

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1 INTRODUCTION

The Texas Commission on Environmental Quality (TCEQ) was tasked by the U.S. Environmental Protection Agency (EPA) Region VI to conduct a Preliminary Assessment (PA) of the Circle Court Ground Water (the Site) located in Parker County, Texas. The PA is an initial screening of the Site's conditions to determine compliance with standards and regulations pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended, 42 U.S.C. 9601, et seq. (Ref. 1, 2 and 3). For this purpose, the Site is a geographical area located within a rural area south of Interstate 20 in eastern Parker County, Texas. The source for the release to groundwater is currently unknown.

The specific goals for the Circle Court Ground Water investigation are:

- Determine the potential threat to public health or the environment posed by the Site;
- Determine the potential for a release of hazardous constituents into the environment; and
- Determine the potential for placement of the Site on the National Priorities List (NPL).

Completion of the PA included reviewing existing Site information, collecting receptor information within the range of Site influence, and determining regional geology, groundwater, surface water and surrounding population. This document includes a discussion of Site background information (Section 2), a discussion of migration/exposure pathways and potential receptors (targets; Section 3) and a list of pertinent references (Section 4).

2 SITE BACKGROUND

2.1 SITE LOCATION

Site Name:	Circle Court Ground Water
CERCLIS ID No.:	TXN000606965
Location:	Parker County, Texas
Latitude:	32.745N
Longitude:	-97.678333W
Legal Description:	Lots 1 and 2, Block 3, Hillcrest Subdivision
Congressional District:	U.S. Congressional District 12
Site Owner:	City of Willow Park 516 Ranch House Road Willow Park, TX 76087 (817) 441-7108
Site Contact:	Lance Petty Director of Public Works 3500 Indian Camp Willow Park, TX 76087 (817) 441-5027

2.2 SITE DESCRIPTION

The Circle Court Ground Water site (the "Site") is located at 117 Circle Court, 100 yards north-northwest of the intersection of Circle Drive and Circle Court in Willow Park, Parker County, Texas. It lies 0.28 miles south of Interstate 20 and 0.3 mile west of FM 5 (Annetta Road) and is 6 miles east of the City of Weatherford (Fig. 2-1). In this rural residential area, single-family residences immediately surround the Site on the south, west and east sides. A 15-acre vacant wooded lot borders the Site on the north. North of the wooded lot, approximately 0.15 miles north of the Site, is a truck stop/diner. Lake Weatherford is approximately 1.75 miles north of the Site.

The main building of the Parker County Airport is 0.32 miles northwest of the Site at 3816 E. Interstate 20 in the City of Hudson Oaks, and the nearest point of the north/south-oriented airport runway is 0.22 miles west of the Site. A lawnmower repair shop is located 0.28 miles northwest of the Site, and a strip shopping center, which includes a dry cleaner facility and a gas station, is located 0.21 miles east-northeast of the Site (Figure 2-2).

The Site is designated as contaminated ground water originating from an unknown source. A volatile organic compound (VOC), trichloroethene (TCE), was first detected in concentrations above the EPA maximum contaminant limit (MCL) for drinking water of 5 micrograms per liter (μg/L) in a routine ground water sampling event conducted on March 23, 2006. Trichloroethene is a colorless or blue organic liquid with a chloroform-like odor. The greatest use of trichloroethene is to remove grease from fabricated metal parts and some textiles (Ref. 4, p. 1).

2.3 OWNERSHIP HISTORY

State Well No. 32-19-201 is the indicator and nearest well to the contaminated ground water. The well is part of the Willow Park Municipal System, which is owned and operated by the City of Willow Park. Originally, Willow Park operated a portion of the old Chico water system and a separate water system just to the east of Lake Weatherford. Over time, the incorporation of several other private well systems and city wells were included to form a large system capable of supplying new subdivisions. An upgrade involved the connection of the main system, which is east of the Clear Fork, with the Willow Springs Oaks area, west of the Clear Fork (Ref. 5, p. 10-1).

Willow Park Municipal System is registered in the Public Water Supply (PWS) Program, Identification No. 1840027. The indicator well is located at latitude 32.745N and longitude -97.678333W at the Willow Springs Oaks Pump Station, 117 Circle Court, Willow Park, Texas. The indicator well is identified by Willow Park Municipal System as Well No. 20 (TCEQ Source Code G1840027U). Texas Water Development Board Water Well data indicate that the well was drilled on 07/15/1965 to a depth of 180 feet (Ref. 6, p. 55). The indicator well is one of three active wells in the Willow Park Municipal System that were formerly registered in the PWS Program to the City of Willow Park under the Willow Springs Oaks Water System, PWS Identification No. 1840093. The two water systems were merged in 2001 (Ref. 7, p. 2). The three wells that were formerly part of the Willow Springs Oaks Water System now provide drinking water to 114 residential connections in Pressure Plane No. 2 of the Willow Park Municipal System (Ref. 8, p. 3).

2.4 OPERATIONS AND WASTE CHARACTERISTICS

The Willow Park Municipal System currently provides drinking water to approximately 5,897 persons through 1,685 connections (Ref. 9, p. 1). Ground water is pumped from 17 operational wells through 5 pump stations to 11 points of entry (POE) in the system: Indian Camp Pump Station (POE001), located at 3500 Indian Camp; Willow Wood Pump Station (POE002), located at 3323 Forest Circle; Fox Hunt Pump Station (POE009), located at 1109 Fox Hunt Trail; Willow Springs Pump Station (POE010), located at 4820 Misty Meadow; and Willow Springs Oaks Pump Station (POE011), located at 117 Circle Court. The indicator well, Well 20, is the only well providing drinking water to the distribution system through POE011. TCE was detected at a concentration above the MCL in a routine sample collected at POE011 on March 23, 2006, and granular activated carbon (GAC) filters were installed on the well on June 19, 2006. The well was subsequently put back into service. Presently, ground water pumped from Well 20 at the Willow Spring Oaks Pump Station passes through the filters before being disinfected by hypochlorination and sent to the above-ground water storage tank for distribution (Ref. 8, pp. 2-4).

Chemical use is limited to disinfection of the raw ground water by gaseous chlorination at the Indian Camp Pump Station and by sodium hypochlorite at all other pump stations. Monitoring and recording of chlorine residual at each POE is performed by water system personnel on a daily basis (Ref. 9, p. 5).

The TCEQ Drinking Water Quality Team has set sampling requirements and sample collection schedules for each POE in the Willow Park Municipal System in addition to periodic monitoring in the distribution system. At POE011 (Sample Site 11), the following tests and sample periods are required:

a. Cyanide; 6-year
b. Minerals; triennial
c. Metals; 6-year
d. Nitrate; annual
e. Radionuclides; triennial

f. Synthetic organic compounds; triennial

g. Volatile organic compounds; annual

Samples are tested for volatile organic compounds on an annual basis at POE011 due to the past detections (Ref. 10, pp 1-3).

2.5 PREVIOUS INVESTIGATIONS

Routine Comprehensive Compliance Investigations (CCI) were conducted by TCEQ PWS personnel in 1999, 2001, 2002 and 2007. A Notice of Violation was issued on January 3, 2008 for alleged record-keeping and facility maintenance violations noted during the most recent CCI conducted on October 24, 2007. Compliance documentation was subsequently submitted to the TCEQ Region 4 office, and a Notice of Compliance was issued on September 25, 2008.

Pursuant to a request from the TCEQ, Eagle Construction and Environmental Services, L.P. (Eagle) mobilized to the City of Willow Park on June 1, 2006 to initiate sampling of select private water wells in the vicinity of Willow Park Municipal System Well 20 (State Well ID No. 32-19-201). The June 1-2, 2006 sampling event was conducted as a result of TCE detection of 33.91 µg/L, above the MCL of 5.0 µg/L, in a sample collected from POE011 on May 4, 2006 as a follow-up to the March 23, 2006 routine sample. Because of the potential emergency situation of multiple private well owners drinking contaminated groundwater, the TCEQ Field Operations Division authorized Eagle to collect and have analyzed water samples from nine (9) private water wells in the vicinity (Figure 2-3). The samples were analyzed for concentrations of VOCs by a drinking water certified laboratory utilizing drinking water methods. A review of the laboratory analytical results indicated that concentrations of TCE (above laboratory detection limits) were detected in five (5) of the samples collected from the private water wells.

2.5.1 Sample Results

Available water sample analyses data from the TCEQ Drinking Water Quality Team, Public Drinking Water Section indicate that TCE was first detected in a routine sample collected from POE010 on 10/29/2001 at a concentration of 2.4 µg/L, below the MCL of 5.0 µg/L (Table 2-1) (Ref. 11, pp 1-10). TCE was next detected in a routine sample collected from POE011 on 03/19/2002 at a concentration of 1.9 µg/L. POE010 and POE011 are interconnected by a valve located at the corner of Bankhead Road and Kingswood Road. The valve is open under normal operating procedures

(Ref. 9, p. 11). The locations of POE010, POE011 and the interconnection valve are shown in Figure 2-3. Six subsequent samplings conducted periodically at POE011 from 09/18/2002 to 03/15/2005 revealed TCE detections ranging from 1.3 μg/L to 3.4 μg/L, all below the MCL of 5 μg/L. On 03/23/2006 the routine sample at POE011 revealed a TCE concentration of 6.03 μg/L. As a result, Willow Park Municipal System voluntarily took Well 20 out of service on 4/1/2006 (Ref. 12, p. 1). Follow-up confirmation sampling directly from Well 20 was conducted on 05/04/2006 and revealed a TCE concentration of 33.9 μg/L (Ref. 13, pp. 1-5).

On 06/19/2006 the GAC filters were installed on Well 20 so that the pumped water first passes through the filters prior to disinfection by hypochlorination and being sent to the above-ground storage tank. Willow Park Municipal System personnel subsequently began voluntary periodic collection of samples for TCE concentrations before and after the GAC filters at POE011. The samples were analyzed for concentrations of VOCs by Talem, Inc., a drinking water certified laboratory, utilizing drinking water methods. The TCE concentrations after the filter at POE011 have been below the MCL. The results of the raw water and post-filter TCE concentrations from POE011 in samples collected by Willow Park Municipal System personnel are listed in Table 2.1. An anomaly exists in the sample results from the 12/05/2007 and may be due to a mislabeling of samples (Ref. 14).

Other hazardous substances have been detected in samples from POE011, as well as other POE in the Willow Park Municipal System. Table 2-2 lists historical sampling analyses results for VOCs in all POE of the Willow Park Municipal System.

Eagle mobilized to the Willow Park Municipal System on June 1, 2006 to initiate the water well sampling activities from nine (9) private wells in the vicinity of POE011. The wells sampled on June 1 and 2, along with the well owners' names and addresses, are summarized in Table 2-3. The locations of the sampled water wells are shown in Figure 2.4 (Ref. 15).

A review of the laboratory analytical results indicated that concentrations of trichloroethylene (above laboratory detection limits) were detected in several of the samples collected from the water wells, including Davis #1 (1.54 μg/L), Murphy (2.59 μg/L) Lasater #1 (4.67 μg/L); Keller (2.45 μg/L) and Barnett #2 (12.2 μg/L). Low concentrations of methylene chloride were present in all of the samples, including the field blanks, duplicates and trip blank, and this compound is considered to be an artifact of laboratory contamination and not a constituent of concern. In addition, 1, 4-dichlorobenzene and naphthalene were detected at very low concentrations in both field blanks but were not detected in any of the well samples. For this reason, these two compounds are not considered constituents of concern (Ref. 15). A summary of the laboratory analytical results for all of the private water well samples, including quality control samples, is included in Table 2-4.

2.5.2 Sources

The Willow Springs Oaks pump station is located in a rural residential area. No potential sources of hazardous substances have been located in the immediate vicinity of POE011. A review of the laboratory analytical results and comparison of these results with the EPA primary drinking water standards indicate that the MCL for TCE was exceeded in the sample collected from the Barnett #2 well located at Parker County Airport. Concentrations of TCE below the drinking water MCL were detected in several of the samples collected from wells in the area. The distribution of this compound suggests a source area to the north-northwest of the Willow Park Municipal System's PWS Well 20 (Ref. 15).

2-1 Raw Water and Post-Filter TCE Concentrations from POE 011 Samples Collected by Willow Park Municipal System Personnel (Ref. 14)

Collected date	Raw water TCE concentration (µg/L)	Above MCL or PCL	Post-filter TCE concentration (µg/L)	Above MCL or PCL
06/19/2006(first sample using filters)	6.8	Y	<2.0	N
06/26/2006	6.1	Y	<2.0	N
07/06/2006	5.2	Y	<2.0	N
08/02/2006	2.2	N	<2.0	N
09/06/2006	3.9	N	<2.0	N
10/05/2006	5.4	Y	<2.0	N
11/02/2006	5.7	Y	<2.0	N
12/05/2006	5.4	Y	<2.0	N
01/26/2007	4.7	N	<2.0	N
02/6/2007	3.5	N	<2.0	N
03/06/2007	3.3	N	<2.0	N
04/04/2007	5.0	N	<2.0	N
05/02/2007	3.1	N	<2.0	N
09/05/2007	5.2	Y	<0.19	N
09/14/2007	4.6	N	<0.19	N
10/03/2007	4.5	N	<0.19	N
11/07/2007	1.4	N	<0.19	N
12/05/2007	<0.19	N	4.6	N
01/03/2008	4.5	N	<0.19	N
02/06/2008	5.6	Y	<0.19	N
03/06/2008	5.7	Y	<0.19	N

2-2 Historical Sampling Analyses Results for Volatile Organic Compounds (Ref. 11)

POE	Contaminants	Collection date	Concentration (µg/L)	Above MCL
POE001	Bromodichloromethane	02/09/1999	2.30	
	Bromoform		4.7	
	Chloroform		0.7	
	Dibromochloromethane		6.1	
	Bromodichloromethane	03/08/1999	1.2	
	Bromoform		3.2	
	Dibromochloromethane		4.1	
	Bromodichloromethane	11/07/2000	1.4	
	Bromoform		6.9	
	Dibromochloromethane		4.9	
	Bromodichloromethane	03/19/2002	1.7	
	Bromoform		3.3	
	Dibromochloromethane		3.4	
POE002	Bromodichloromethane	03/08/1999	1.2	
	Bromoform		3.2	
	Dibromochloromethane		3.5	
	Bromodichloromethane	11/07/2000	3.7	
	Bromoform		20	
	Chloroform		1.0	
	Dibromochloromethane		11	
POE004	2-Butanone	03/25/1996	74	
	Tetrahydrofuran		41.0	
	Chloroform	11/07/2000	1.1	
POE006	Chloroform	11/07/2000	0.5	
POE008	Dichloromethane	05/30/1996	2.7	
	Bromodichloromethane	03/19/2002	3.2	

	Bromoform		0.6	
	Chloroform		3.6	
	Dibromochloromethane		2.2	
POE009	Dibromochloromethane	11/11/2004	0.6	
POE010	Chloroform	10/29/2001	0.5	
	Trichloroethene		2.4	
	2-Butanone(MEK)	05/22/2002	37	
	Bromodichloromethane		9.7	
	Bromoform		0.9	
	Carbon Tetrachloride		1.0	
	Chloroform		19	
	Dibromochloromethane		5.0	
	Tetrahydrofuran		12	
	2-Furancarboxaldehyde	09/18/2002	1.1	
	Bromodichloromethane		10	
	Bromoform		0.7	
	Chloroform		18	
	Dibromochloromethane		5.4	
	Bromodichloromethane	11/19/2002	1.4	
	Chloroform		1.0	
	Dibromochloromethane		1.2	
	Bromodichloromethane	03/25/2003	1.1	
	Chloroform		0.9	
	Dibromochloromethane		0.8	
	Chloroform	03/15/2005	1.1	
	Dibromochloromethane		1.2	
	Dichlorobromomethane		1.4	
	Bromodichloromethane	03/23/2006	1.38	
	Dibromochloromethane		1.48	

	Bromodichloromethane	02/22/2007	0.8	
	Chloroform		0.6	
	Dibromochloromethane		0.9	
POE011	Chloroform	10/29/2001	0.8	
	Chloroform	03/19/2002	0.7	
	Dibromochloromethane		0.6	
	Trichloroethene		1.9	
	Bromodichloromethane	09/18/2002	1.3	
	Chloroform		2.6	
	Dibromochloromethane		0.6	
	Trichloroethene		1.8	
	Bromodichloromethane	11/19/2002	1.8	
	Chloroform		2.1	
	Dibromochloromethane		1.2	
	Trichloroethene		1.9	
	Bromodichloromethane	03/25/2003	1.7	
	Chloroform		1.3	
	Dibromochloromethane		1.3	
	Trichloroethene		1.3	
	Bromoform	11/11/2004	1.5	
	Chloroform		1.1	
	Dibromochloromethane		3.1	
	Dichlorobromomethane		2.1	
	Trichloroethene		3.4	
	Bromoform	03/15/2005	1.2	
	Chloroform		0.8	
	Dibromochloromethane		2.4	

	Dichlorobromomethane		1.6	
	Trichloroethene		2.8	
	Bromodichloromethane	03/23/2006	2.95	
	Bromoform		2.36	
	Chloroform		1.68	
	Dibromochloromethane		4.46	
	Trichloroethene		6.03	Y
	Acetone	05/04/2006	7.84	
	Bromodichloromethane	02/22/2007	0.6	
	Chloroform		0.5	
	Dibromochloromethane		0.9	
	Isopropyl alcohol	09/17/2008	3.9	
Well 20 at POE011	Trichloroethene	03/25/2003	2.0	Y
Well 20 at POE 011	Trichloroethene	05/04/2006	33.9	Y

2-3 Private Wells Sampled June 1-2, 2006 (Ref. 15)

Well ID	Depth of Well (ft.)	Owner	Owner Address	Phone Number	Access Agreement	Number of Well (s)
1	240-300	Perry J. Davis	550 Russell Road, Weatherford, TX 76087	817/613-8854	Y	2
2		Sharon Lasater	546 Russell Road, Weatherford, TX 76087	817/613-1196	Y	2
3	261	Vinita J. Hall	503 Russell Road, Willow Park, TX 76087	817/596-5915	Y	1
4	250	George Murphy	108 E. Circle Drive, Weatherford, TX 76087	817/596-0476	Y	1
5		Dennis Sherman	300 Russell Road, Weatherford, TX 76087	817/596-5957	Y	1
6	300	Guy Keller	110 Circle Drive, Willow Park, TX 76087	817/594-8539	Y	1
7	240	Gearld Liepert	408 Deer Pond Drive, Willow Park, TX 76087	817/599-3503	Y	1
8	200	Kelley Barnett	3816 East I-20, Weatherford, TX 76087	817/599-7772	Y	1
9	200	Kelley Barnett	3816 East I-20, Weatherford, TX 76087	817/599-7772	Y	1

2-4 Summary of Groundwater and QA/QC Laboratory Analytical Results of Private Well Sampling

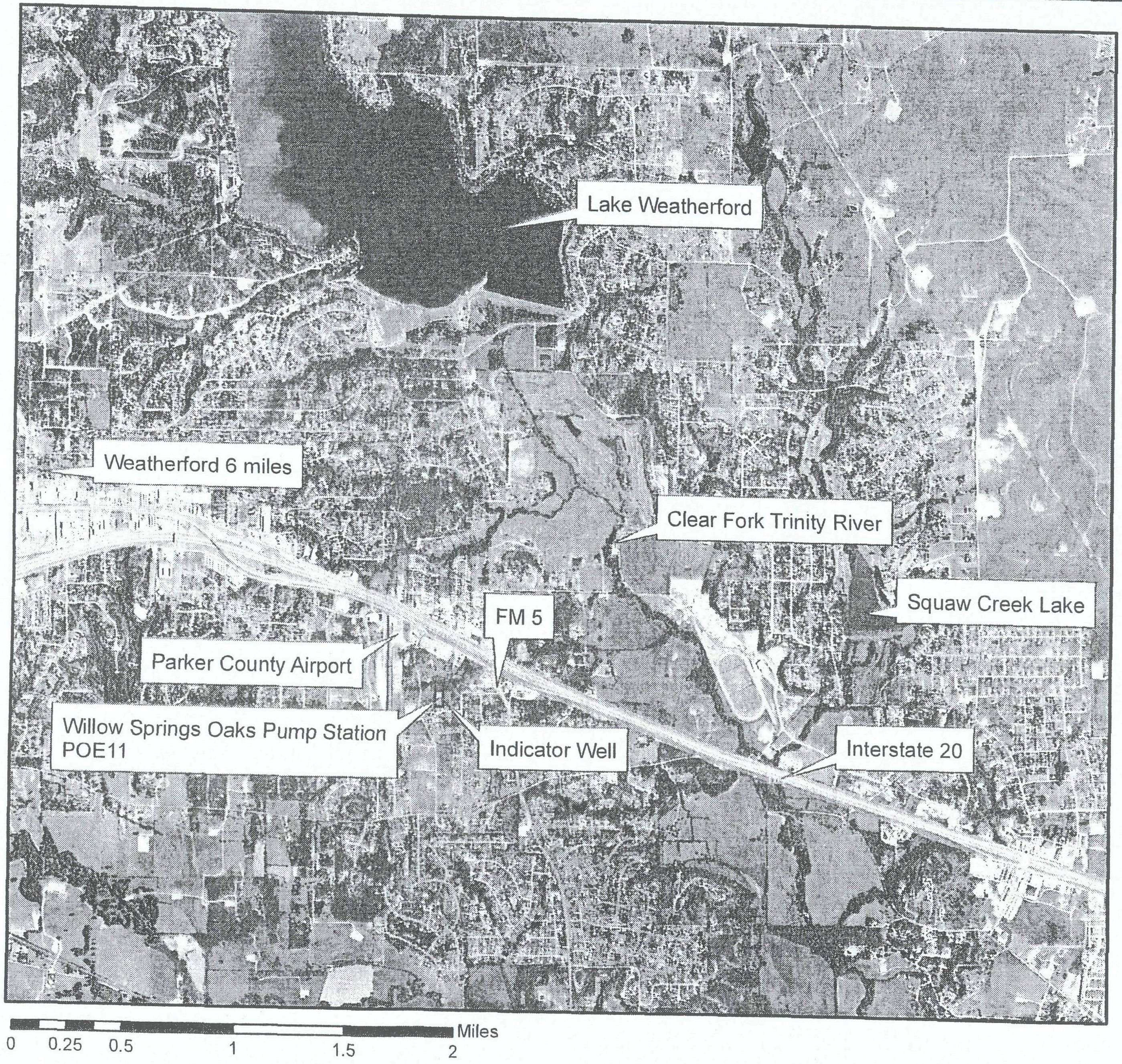
	Analyte	Davis #1 Lab ID 266929-001 Sampled 6-1-06	Hall Lab ID 266929-002 Sampled 6-1-06	Sherman Lab ID 266929-003 Sampled 6-1-06	Murphy Lab ID 266929-004 Sampled 6-1-06	Lasater #1 Lab ID 266929-005 Sampled 6-1-06	Tier 1 Residential Groundwater PCLs[1]	Primary Drinking Water Standard (ug/L)
Volatile Organic Compounds EPA Method 524.2 (ug/L)	Benzene	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	5.0
	Bromobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	490	-
	Bromochloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	980	-
	Bromodichloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	15	-
	Bromoform	<1.00	<1.00	<1.00	<1.00	<1.00	120	-
	Methyl bromide	<1.00	<1.00	<1.00	<1.00	<1.00	34	-
	tert-Butylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	980	-
	Sec-Butylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	980	-
	n-Butylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	980	-
	Carbon Tetrachloride	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	5.0
	Chlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	100	-
	Chloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	9800	-
	Chloroform	<1.00	<1.00	<1.00	<1.00	<1.00	240	-
	Methyl Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	-
	2-Chlorotoluene	<1.00	<1.00	<1.00	<1.00	<1.00	490	-
	4-Chlorotoluene	<1.00	<1.00	<1.00	<1.00	<1.00	490	-
	1,2-Dibromo-3-Chloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	0.20	-
	Dibromochloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	11	-
	1,2-Dibromoethane	<1.00	<1.00	<1.00	<1.00	<1.00	0.050	-
	Methylene bromide	<1.00	<1.00	<1.00	<1.00	<1.00	34	-
	1,2-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	600	-
	1,3-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	730	-
	1,4-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	75	-
	Dichlorodifluoromethane	<1.00	<1.00	<1.00	<1.00	<1.00	4900	-
	1,1-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	2400	-
	1,2-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	5.0
	cis-1,2-Dichloroethylene	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	70
	trans-1,2-dichloroethylene	<1.00	<1.00	<1.00	<1.00	<1.00	100	100
	1,1-Dichloroethylene	<1.00	<1.00	<1.00	<1.00	<1.00	7.0	7.0
	1,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	5.0
	1,3-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	9.1	-
	2,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	13	-
	1,1-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	9.1	-
	cis-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	1.7	-
	trans-1,3-dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	9.1	-
	Ethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	700	700
	Hexachlorobutadiene	<1.00	<1.00	<1.00	<1.00	<1.00	4.9	-
	isopropylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	2400	-
	p-Cymene (p-Isopropyltoluene)	<1.00	<1.00	<1.00	<1.00	<1.00	2400	-
	Methylene Chloride	**0.650 J**	**0.440 J**	**0.630 J**	**0.490 J**	**0.560 J**	5.0	-
	Naphthalene	<1.00	<1.00	<1.00	<1.00	<1.00	490	-
	n-Propylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	980	-
	Styrene	<1.00	<1.00	<1.00	<1.00	<1.00	100	100
	1,1,1,2-Tetrachloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	35	-
	1,1,2,2-Tetrachloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	4.6	-
	Tetrachloroethylene	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	5.0
	Toluene	<1.00	<1.00	<1.00	<1.00	<1.00	1000	1000
	1,2,3-Trichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	73	-
	1,2,4-Trichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	70	70
	1,1,1-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	200	200
	1,1,2-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	5.0
	Trichloroethylene	**1.54**	<1.00	<1.00	**2.59**	**4.67**	5.0	5.0
	Trichlorofluoromethane	<1.00	<1.00	<1.00	<1.00	<1.00	7300	-
	1,2,3-Trichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	0.13	-
	1,2,4-Trimethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	1200	-
	1,3,5-Trimethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	1200	-
	Vinyl Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	2.0	2.0
	o-Xylene	<1.00	<1.00	<1.00	<1.00	<1.00	10000	10000
	m,p-Xylenes	<2.00	<2.00	<2.00	<2.00	<2.00	10000	10000

**

	Analyte	Dup-1 Lab ID 266929-006 Sampled 6-1-06	Field Blank Lab ID 266929-007 Sampled 6-1-06	Trip Blank Lab ID 266929-008 Sampled 6-1-06	Keller Lab ID 267000-001 Sampled 6-2-06	Liepert Lab ID 267000-002 Sampled 6-2-06	Tier 1 Residential Groundwater PCLs[1]	Primary Drinking Water Standard (ug/L)
Volatile Organic Compounds EPA Method 524.2 (ug/L)	Benzene	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	5.0
	Bromobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	490	-
	Bromochloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	980	-
	Bromodichloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	15	-
	Bromoform	<1.00	<1.00	<1.00	<1.00	<1.00	120	-
	Methyl bromide	<1.00	<1.00	<1.00	<1.00	<1.00	34	-
	tert-Butylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	980	-
	Sec-Butylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	980	-
	n-Butylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	980	-
	Carbon Tetrachloride	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	5.0
	Chlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	100	-
	Chloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	9800	-
	Chloroform	<1.00	<1.00	<1.00	<1.00	<1.00	240	-
	Methyl Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	-
	2-Chlorotoluene	<1.00	<1.00	<1.00	<1.00	<1.00	490	-
	4-Chlorotoluene	<1.00	<1.00	<1.00	<1.00	<1.00	490	-
	1,2-Dibromo-3-Chloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	0.20	-
	Dibromochloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	11	-
	1,2-Dibromoethane	<1.00	<1.00	<1.00	<1.00	<1.00	0.050	-
	Methylene bromide	<1.00	<1.00	<1.00	<1.00	<1.00	34	-
	1,2-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	600	-
	1,3-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	730	-
	1,4-Dichlorobenzene	<1.00	**1.55**	<1.00	<1.00	<1.00	75	-
	Dichlorodifluoromethane	<1.00	<1.00	<1.00	<1.00	<1.00	4900	-
	1,1-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	2400	-
	1,2-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	5.0
	cis-1,2-Dichloroethylene	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	70
	trans-1,2-dichloroethylene	<1.00	<1.00	<1.00	<1.00	<1.00	100	100
	1,1-Dichloroethylene	<1.00	<1.00	<1.00	<1.00	<1.00	7.0	7.0
	1,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	5.0
	1,3-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	9.1	-
	2,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	13	-
	1,1-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	9.1	-
	cis-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	1.7	-
	trans-1,3-dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	9.1	-
	Ethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	700	700
	Hexachlorobutadiene	<1.00	<1.00	<1.00	<1.00	<1.00	4.9	-
	isopropylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	2400	-
	p-Cymene (p-Isopropyltoluene)	<1.00	<1.00	<1.00	<1.00	<1.00	2400	-
	Methylene Chloride	**0.640 J**	**0.520 J**	**4.00**	**0.590 J**	**0.790 J**	5.0	-
	Naphthalene	<1.00	**0.200 J**	<1.00	<1.00	<1.00	490	-
	n-Propylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	980	-
	Styrene	<1.00	<1.00	<1.00	<1.00	<1.00	100	100
	1,1,1,2-Tetrachloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	35	-
	1,1,2,2-Tetrachloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	4.6	-
	Tetrachloroethylene	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	5.0
	Toluene	<1.00	<1.00	<1.00	<1.00	<1.00	1000	1000
	1,2,3-Trichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	73	-
	1,2,4-Trichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	70	70
	1,1,1-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	200	200
	1,1,2-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	5.0
	Trichloroethylene	<1.00	<1.00	<1.00	**2.45**	<1.00	5.0	5.0
	Trichlorofluoromethane	<1.00	<1.00	<1.00	<1.00	<1.00	7300	-
	1,2,3-Trichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	0.13	-
	1,2,4-Trimethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	1200	-
	1,3,5-Trimethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	1200	-
	Vinyl Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	2.0	2.0
	o-Xylene	<1.00	<1.00	<1.00	<1.00	<1.00	10000	10000
	m,p-Xylenes	<2.00	<2.00	<2.00	<2.00	<2.00	10000	10000

	Analyte	Barnett #1 Lab ID 267000-003 Sampled 6-2-06	Barnett #2 Lab ID 267000-004 Sampled 6-2-06	Dup-2 Lab ID 267000-005 Sampled 6-2-06	Field Blank Lab ID 267000-006 Sampled 6-2-06	Effluent #2 Lab ID 267002-001 Sampled 6-2-06	Tier 1 Residential Groundwater PCLs[1]	Primary Drinking Water Standard (ug/L)
Volatile Organic Compounds EPA Method 524.2 (ug/L)	Benzene	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	5.0
	Bromobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	490	-
	Bromochloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	980	-
	Bromodichloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	15	-
	Bromoform	<1.00	<1.00	<1.00	<1.00	<1.00	120	-
	Methyl bromide	<1.00	<1.00	<1.00	<1.00	<1.00	34	-
	tert-Butylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	980	-
	Sec-Butylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	980	-
	n-Butylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	980	-
	Carbon Tetrachloride	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	5.0
	Chlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	100	-
	Chloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	9800	-
	Chloroform	<1.00	<1.00	<1.00	<1.00	<1.00	240	-
	Methyl Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	-
	2-Chlorotoluene	<1.00	<1.00	<1.00	<1.00	<1.00	490	-
	4-Chlorotoluene	<1.00	<1.00	<1.00	<1.00	<1.00	490	-
	1,2-Dibromo-3-Chloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	0.20	-
	Dibromochloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	11	-
	1,2-Dibromoethane	<1.00	<1.00	<1.00	<1.00	<1.00	0.050	-
	Methylene bromide	*<1.00*	*<1.00*	*<1.00*	*<1.00*	<1.00	34	-
	1,2-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	600	-
	1,3-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	730	-
	1,4-Dichlorobenzene	<1.00	<1.00	<1.00	**1.60**	<1.00	75	-
	Dichlorodifluoromethane	<1.00	<1.00	<1.00	<1.00	<1.00	4900	-
	1,1-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	2400	-
	1,2-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	5.0
	cis-1,2-Dichloroethylene	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	70
	trans-1,2-dichloroethylene	<1.00	<1.00	<1.00	<1.00	<1.00	100	100
	1,1-Dichloroethylene	<1.00	<1.00	<1.00	<1.00	<1.00	7.0	7.0
	1,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	5.0
	1,3-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	9.1	-
	2,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	13	-
	1,1-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	9.1	-
	cis-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	1.7	-
	trans-1,3-dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	9.1	-
	Ethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	700	700
	Hexachlorobutadiene	<1.00	<1.00	<1.00	<1.00	<1.00	4.9	-
	isopropylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	2400	-
	p-Cymene (p-Isopropyltoluene)	<1.00	<1.00	<1.00	<1.00	<1.00	2400	-
	Methylene Chloride	**0.760 J**	**0.610 J**	**0.820 J**	**0.490 J**	<2.00	5.0	-
	Naphthalene	<1.00	<1.00	<1.00	**0.200 J**	<1.00	490	-
	n-Propylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	980	-
	Styrene	<1.00	<1.00	<1.00	<1.00	<1.00	100	100
	1,1,1,2-Tetrachloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	35	-
	1,1,2,2-Tetrachloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	4.6	-
	Tetrachloroethylene	<1.00	<1.00	<1.00	<1.00	<1.00	5.0	5.0
	Toluene	<1.00	<1.00	<1.00	<1.00	<1.00	1000	1000
	1,2,3-Trichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	73	-
	1,2,4-Trichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	70	70
	1,1,1-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	200	200
	1,1,2-Trichloroethane	*<1.00*	*<1.00*	*<1.00*	*<1.00*	*<1.00*	*5.0*	*5.0*
	Trichloroethylene	<1.00	**12.2**	<1.00	<1.00	<1.00	5.0	5.0
	Trichlorofluoromethane	<1.00	<1.00	<1.00	<1.00	<1.00	7300	-
	1,2,3-Trichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	0.13	-
	1,2,4-Trimethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	1200	-
	1,3,5-Trimethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	1200	-
	Vinyl Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	2.0	2.0
	o-Xylene	<1.00	<1.00	<1.00	<1.00	<1.00	10000	10000
	m,p-Xylenes	<2.00	<2.00	<2.00	<2.00	<2.00	10000	10000

Figure 2-1 Site Location Map



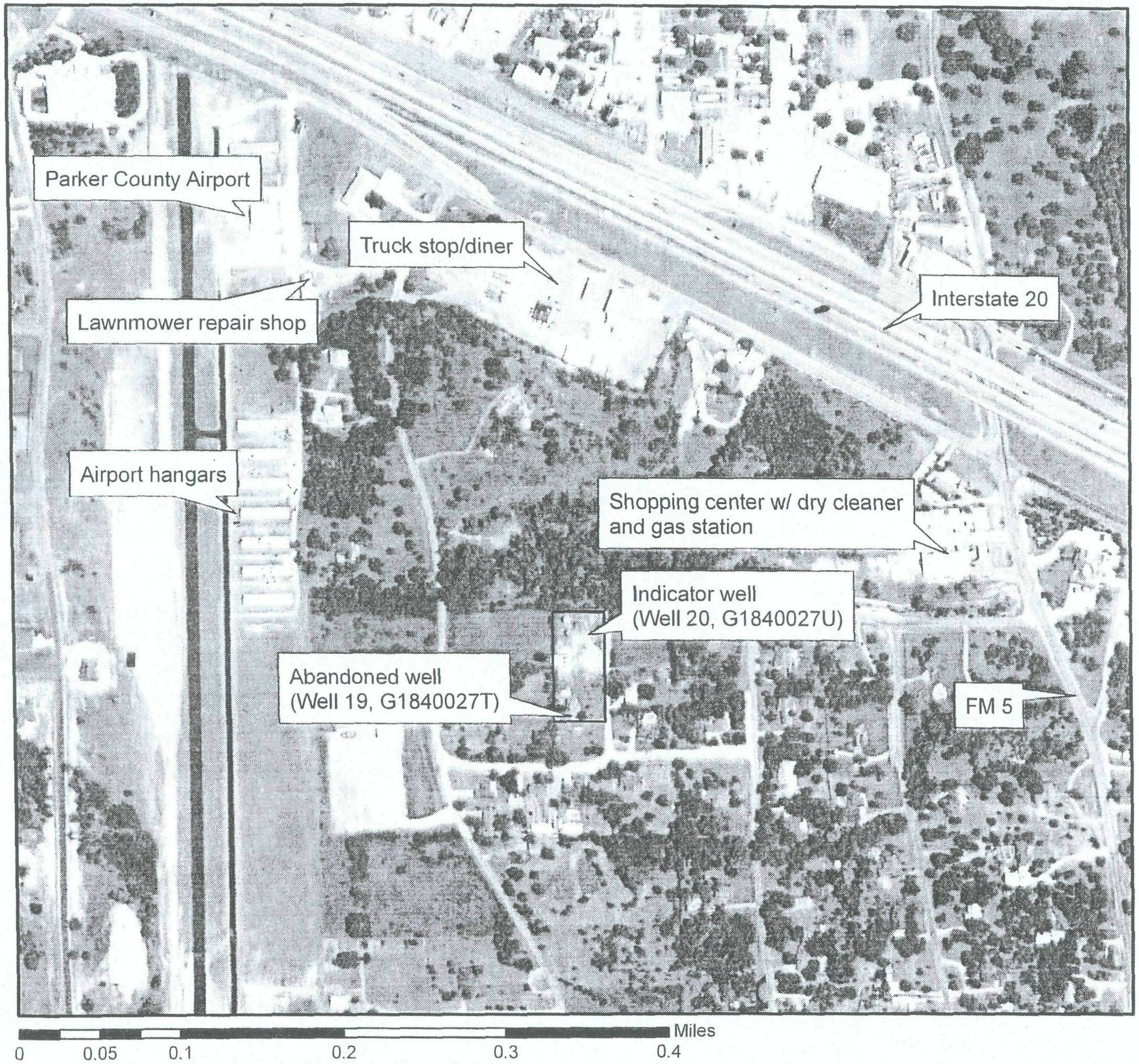
TCEQ

N

SOURCE - The base data used are the Parker County, Texas National Agriculture Imagery Program (NAIP). This NAIP was obtained from the Texas Natural Resource Information System (TNRIS) at www.tnris.state.tx.us. No attempt has been made to alter or correct any data in this NAIP. NAD 1983 UTM Zone 14N.

Circle Court Ground Water
Parker County, Texas
TXN000606965

Figure 2-2 Site Vicinity Map



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SOURCE - The base data used are the Parker County, Texas National Agriculture Imagery Program (NAIP). This NAIP was obtained from the Texas Natural Resource Information System (TNRIS) at www.tnris.state.tx.us. No attempt has been made to alter or correct any data in this NAIP. NAD 1983 UTM Zone 14N.

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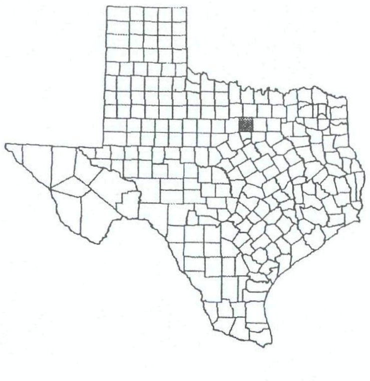
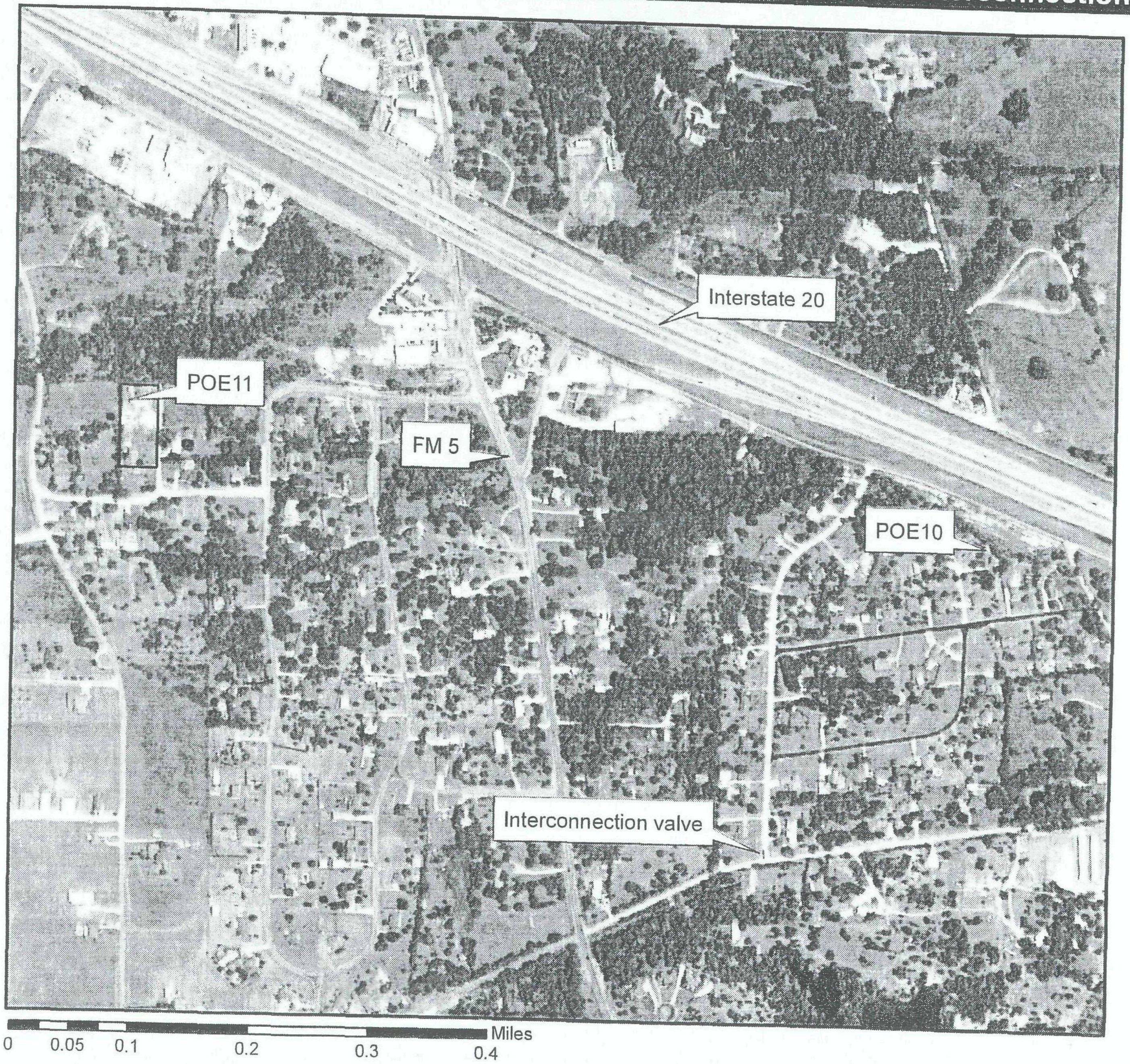


Figure 2-3 Locations of POE010, POE011 and Interconnection Valve



SOURCE - The base data used are the Parker County, Texas National Agriculture Imagery Program (NAIP). This NAIP was obtained from the Texas Natural Resource Information System (TNRIS) at www.tnris.state.tx.us. No attempt has been made to alter or correct any data in this NAIP. NAD 1983 UTM Zone 14N.

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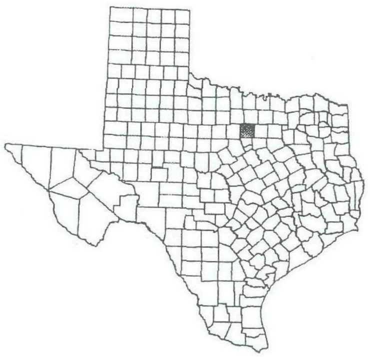
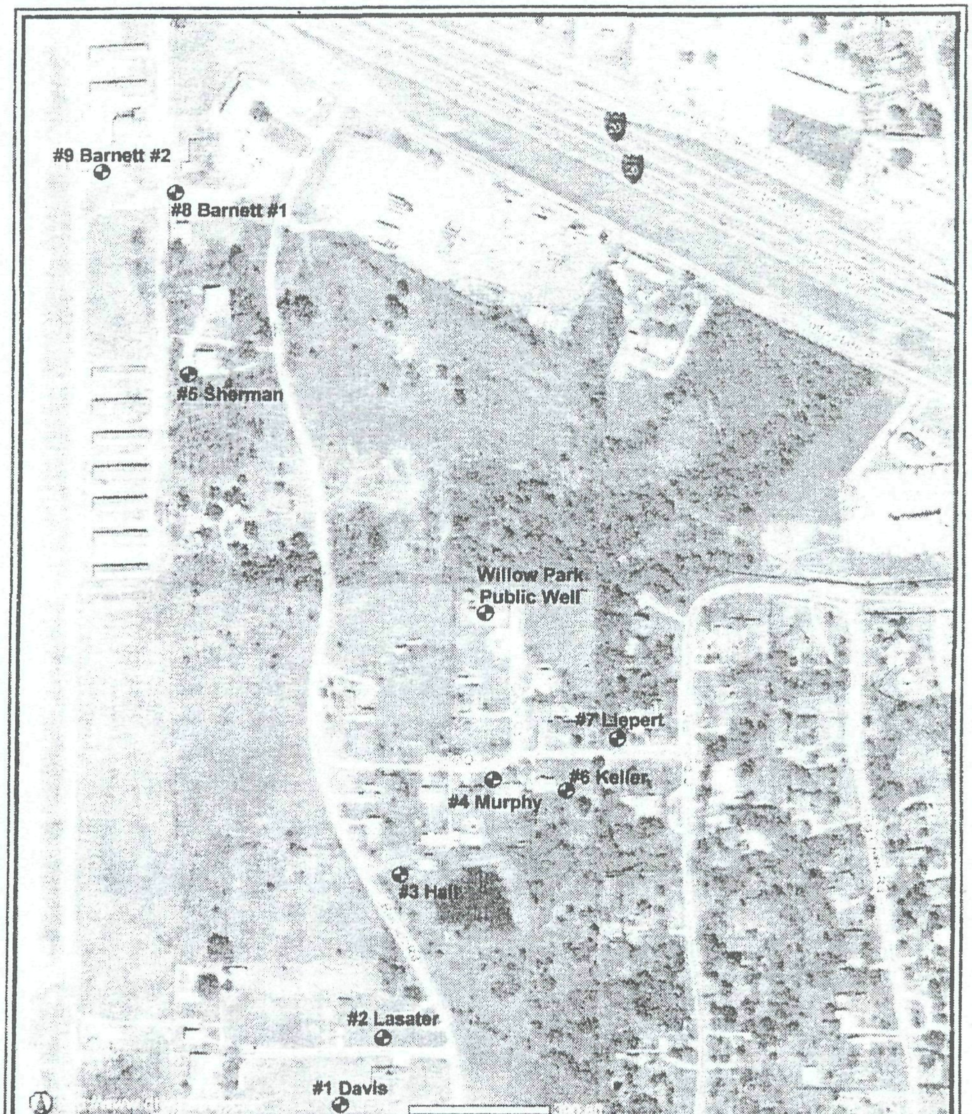


Figure 2-4 Locations of Private Water Wells Sampled June 1-2, 2006 (Ref. 15)



NCTCOG Maps
www.dfwmaps.com

DISCLAIMER
This data has been compiled for NCTCOG. Various official and unofficial sources were used to gather this information. Every effort was made to ensure the accuracy of this data, however, no guarantee is given or implied as to the accuracy of said data.

Eagle Construction and Environmental Services, L.P. 9204 NW Hwy 287 Fort Worth, TX 76131	**Date: 6/6/06** **Project No. 02-64-0019**	**Figure 1** **Location of Private Water Wells** **TCEQ-Willow Park** **Willow Park, Texas**	N

3 MIGRATION/EXPOSURE PATHWAYS

The following sections describe migration/exposure pathways and potential targets within the Site's range of influence (Figure 3-1).

3.1 GROUNDWATER MIGRATION PATHWAY

The target distance limit (TDL) for the groundwater migration pathway is a 4-mile radius that extends from the indicator well. Figure 3-1 depicts the groundwater 4-mile TDL.

3.1.1 Soils

According to the Soil Survey of Parker County, Texas (1977), the Site is located on the Brackett and Maloterre soils, 3 to 12 percent slopes, gently sloping to strongly sloping soils on upland ridges (Ref. 16). The average composition of the soils is 50 percent Brackett soil, 22 percent Maloterre soil and 28 percent soils of minor extent, but composition is variable. Brackett soils are along side slopes and usually have a slope of 5 to 12 percent (Ref. 16, p. 16). In a representative profile of a Brackett soil, the surface layer is calcareous clay loam approximately 4 inches thick. The next 10 inches is calcareous loam. The underlying material is weakly cemented limestone and calcareous clay loam (Ref. 16, p. 15). It is as much as 35 percent limestone gravel, cobbles and fossil fragments. Maloterre soils, where present, are along the more nearly level ridgetops and usually have a slope of 3 to 5 percent. The surface layer of grayish-brown gravelly clay loam is about 8 inches thick. The underlying material is indurated limestone that contains many fossil shells (Ref. 16, p. 16).

3.1.2 Geologic Setting

The Site is located in the Western Cross Timbers region of Texas, on the western margin of the Grand Prairie (Ref. 17). In this vicinity, the Grand Prairie is underlain by alternating limestones and marls of the Fredericksburg Group. The intervening marls form low escarpments that connect successive uplands and produce a "cuesta" topography. The surfaces of the terraces slope gently eastward (Ref. 18, p. 4, 14). The Fredericksburg Group of the Comanche Series consists predominantly of limestone, shale, clay, and marl and yields only small amounts of water to localized areas (Ref. 18, p. 10). In Parker County, the Fredericksburg Group is comprised of the Goodland Formation and Walnut Clay (or Walnut) Formation (Ref. 19, pp. 2-19). The Site and indicator well are located on the Walnut Clay Formation (Fig. 2-5). The Walnut Clay consists of clay and limestone, about equally abundant, with a thickness of approximately 30 ft. (Ref. 20, p. 5). In the Site area, the Walnut Clay overlies the Trinity Group, a water-bearing formation of Cretaceous age (Ref. 19, pp. 2-15, 2-19).

3.1.3 Aquifer System

The Trinity Group is the principal water-bearing group of rocks in the region and is divided into the Paluxy, Glen Rose, Twin Mountains, and Antlers Formations (Ref. 18, p. 10). The indicator well is in the Paluxy Formation of the Trinity Group (Ref. 6, p. 55). The Paluxy Formation is the upper member of the Trinity Group south of the Glen Rose pinch-out and forms the surface of the Western Cross Timbers belt. The dip is easterly at an average rate of 30 feet per mile (5.7 m/km) near the outcrop, increasing to 80 feet per mile (15.2 m/km) near the downdip limit of fresh to slightly saline water (Ref. 18, p.14). The thickness of the Paluxy in the general area of the Site is approximately 95-105 feet (Ref. 20, p. 5).

The Paluxy is composed predominantly of fine- to coarse-grained, friable, homogeneous, white quartz sand interbedded with sandy, silty, calcareous, or waxy clay and shale. In general, coarse-grained sand is in the lower part. The Paluxy grades upward into fine-grained sand with variable amounts of shale and clay. The sands are usually well sorted, poorly cemented, and cross-bedded (Ref. 18, p.14). The Paluxy is capable of yielding small to moderate amounts of water (Ref. 18, p. 10).

The majority of the Paluxy outcrop occurs in Hood, Parker, Tarrant, and Wise Counties and occupies approximately 650 square miles. The primary source of recharge to the Paluxy is precipitation on the outcrop. Secondary sources include recharge from streams flowing across the outcrop and surface-water seepage from lakes. The average annual precipitation on the outcrop is approximately 31 inches. Only a small fraction of the amount is available as effective recharge since there is much runoff and evapotranspiration. Water in the outcrop area is under water-table conditions, and water levels remain fairly constant with only normal seasonal fluctuations. In downdip areas, water is under artesian conditions and is confined under hydrostatic pressure from overlying formations. The average rate of movement of water in the Paluxy amounts to less than 2 feet per year in an easterly direction except in downdip areas of heavy pumpage, where cones of depression have occurred and movement is towards the center of the pumped wells. Water-level measurements indicate the hydraulic gradient is approximately 27 feet per mile (Ref. 18, p. 39).

3.1.4 Drinking Water Receptors

Based on the 2000 U.S. census, the North Central Texas Council of Governments (NCTCOG) estimates that approximately 11,309 persons per live within a 4-mile radius of the Site (Ref. 21, p. 1). However, the NCTCOG has also estimated that the population of Parker County has grown from 88,495 in 2000 to 120,300 in 2008, an increase of nearly 36% (Ref. 22, p. 3).

Well water uses within the 4-mile target distance limit (TDL) include public water supply, domestic, irrigation, commercial, stock or livestock and miscellaneous uses. A search of the TCEQ water well database revealed 61 public water supply wells within the 4-mile TDL (Ref. 23, pp. 1-4). The number of persons served by the public water supply wells is unknown. The Texas Department of Licensing and Regulation database identifies approximately 360 domestic wells within the 4-mile TDL (Ref. 24) (Fig. 3-3). Based on NCTCOG's estimate of 2.82 persons per household within a 4-mile radius of the Site, the total number of persons utilizing domestic wells is 1,016 (Ref. 21, p. 1).

No wetland acreage is located within a 4-mile radius of the Site. It is unknown whether the Site is within a TCEQ Source Water Protection Program area (formerly the Wellhead Protection Program).

3.2 SURFACE WATER MIGRATION PATHWAY

The Surface Water Exposure Pathway will not be evaluated since the Site has been identified as contaminated ground water with no identified source.

3.3 SOIL EXPOSURE PATHWAY

The Soil Exposure Pathway will not be evaluated since the Site has been identified as contaminated ground water with no identified source.

3.4 AIR EXPOSURE PATHWAY

The Air Exposure Pathway will not be evaluated since the Site has been identified as contaminated ground water with no identified source.

Figure 3-1 4-Mile Radius Map

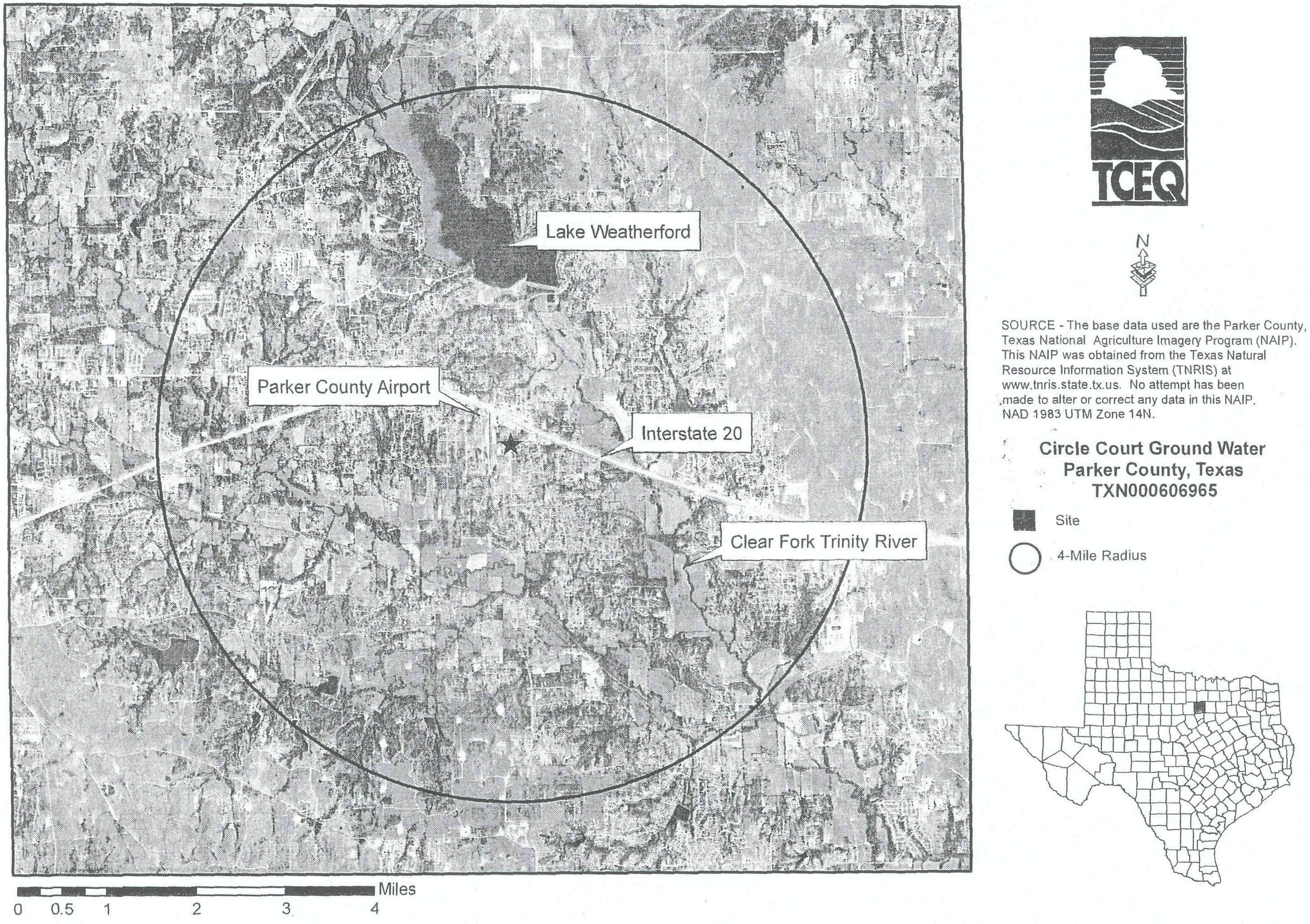


Figure 3-2 Population Within 4-mile Radius (Ref. 21)

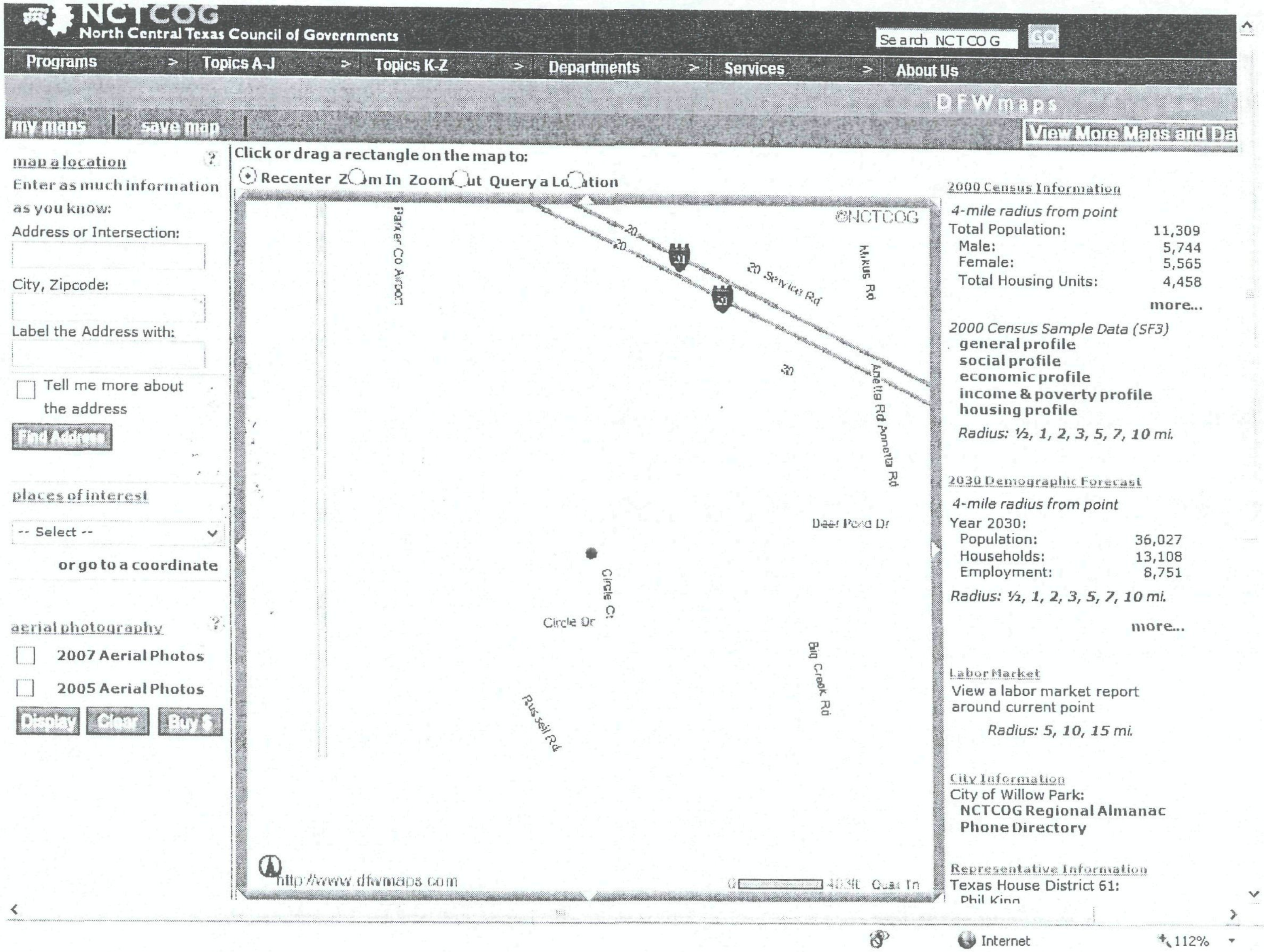
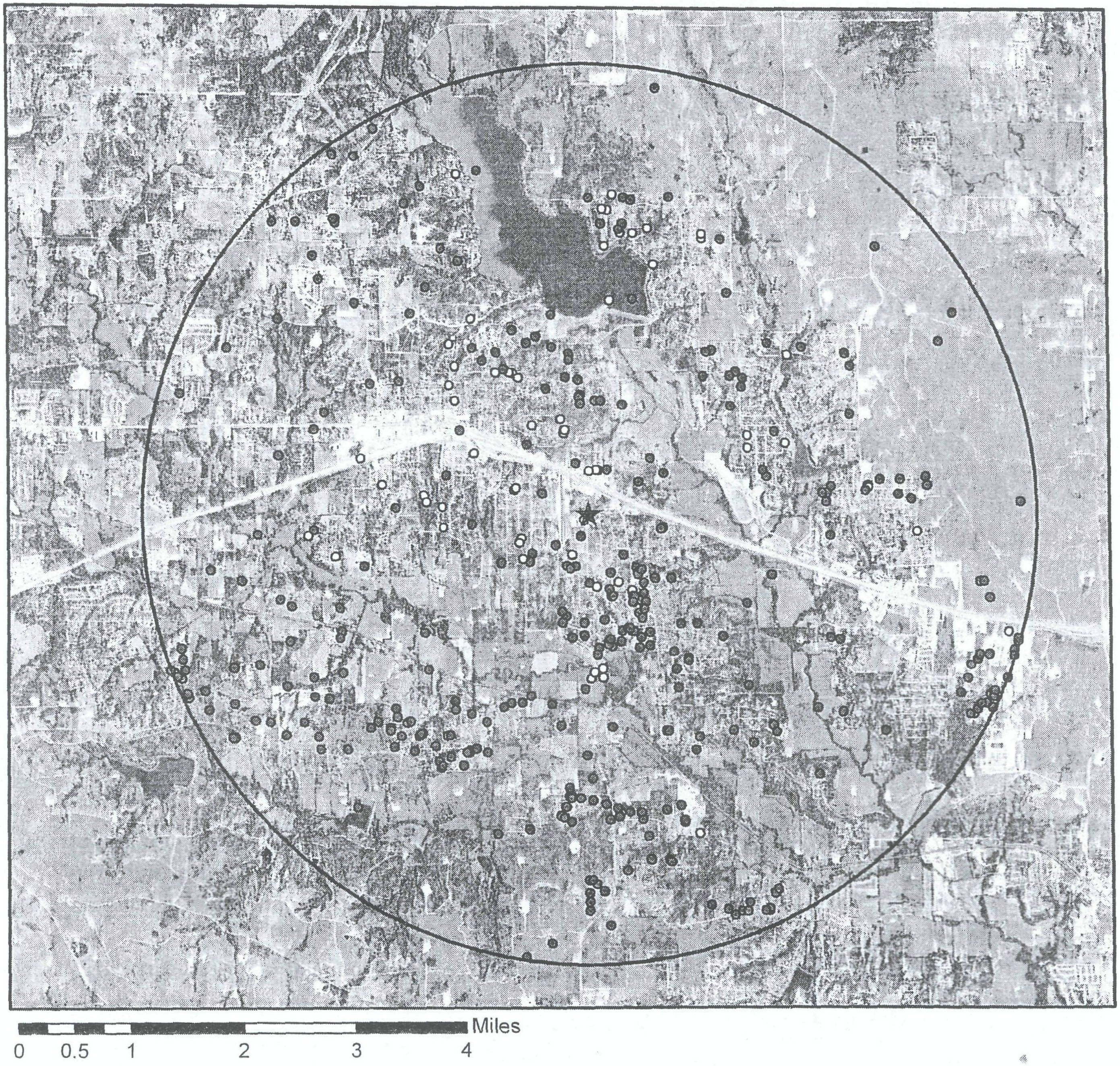


Figure 3-3 Groundwater Drinking Water Wells Within 4-Mile Radius



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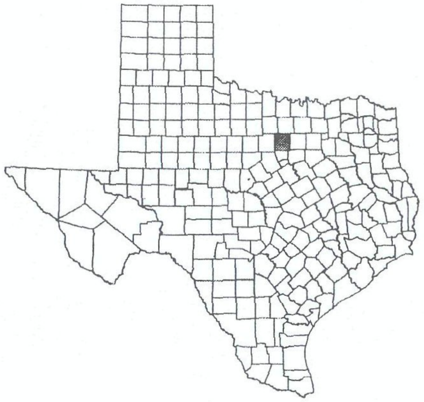
Legend

- Domestic well
- Public water supply well
- Site
- 4-Mile Radius



4 REFERENCES

1. U.S. Environmental Protection Agency. *Federal Register - 40 CFR Part 300, Appendix A; Hazard Ranking System;* Final Rule, 1996 (Cover Page).

2. U.S. Environmental Protection Agency. *Federal Register - 40 CFR Part 300; Hazard Ranking System Guidance Manual;* Interim Final, November 1992 (Cover Page).

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6. Texas Water Development Board, Groundwater Database Reports. *Record of Wells, Parker County.* 71 pages. Available: http://www.twdb.state.tx.us/publications/reports/GroundWaterReports/GWDatabaseReports/Database%20Reports/Parker/Record%20of%20Wells.pdf Accessed on January 2, 2009.

7. Texas Commission on Environmental Quality. *Public Water System Detail/Data Sheet for Willow Springs Oaks Water System.* 2 pages. Available: http://agmt/iwud/pws//index. Accessed on February 2, 2009.

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APPENDIX E

Appendix E - TCEQ's Superfund Standard Operating Procedures (SOPs)

- SOP 7.9 Purging a Drinking Water Well

- SOP 7.10 Sampling a Drinking Water Well

TCEQ

STANDARD OPERATING PROCEDURE NO. 7.9
PURGING A DRINKING WATER WELL

Alan Batcheller, Director
Remediation Division

12/18/07
Date

1.0 METHOD SUMMARY

This standard operating procedure (SOP) is applicable to drinking water wells with a sealed wellhead. Purging is the process of removing water from the well bore which may not be representative of aquifer conditions. Purging a well is performed immediately prior to sampling, causing the replacement of water in the well bore with groundwater from the adjacent formation. This procedure allows for the collection of a representative sample(s) from the water bearing unit(s).

Drinking water wells typically have a sealed wellhead which prevents the use of a water level indicator. Without knowing the total depth of the well, the volume of water in the well cannot be calculated. However, if water level data and well construction records are available, the volume of water in the well bore can be used to estimate a purge volume in accordance with SOP 7.3 (Purging a Monitoring Well with a Pump). To ensure that an adequate volume of water is removed from the well to allow for the collection of a representative sample, the well is generally purged until consistent readings of field parameters are obtained. During purging, a field data sheet shall be completed, and pertinent information and observations shall be entered into the site logbook. Once purging is completed and field parameter values have stabilized, sampling may proceed.

1.1 ASSOCIATED SOPS

SOP 1.4 (Management of Investigative Derived Waste)
SOP 7.3 (Purging a Monitor Well with a Pump)
SOP 7.5 (Measurement of Field Parameters)
SOP 7.10 (Sampling a Drinking Water Well)

2.0 EQUIPMENT/APPARATUS/REAGENTS

The following is a list of equipment typically used for purging a drinking water well.

- Site logbook
- Field data sheets
- Calculator

- Flow-Through Cell (and probes)
- Flow-Through Cell Apparatus (discharge tubing or hose, hose clamps, "Y" adaptor(s))
- Field parameter instruments: pH meter, thermometer, conductivity meter, turbidimeter, DO meter (Individual meters optional/Used in lieu of Flow-Through Cell and probes)
- Calibration standards
- 5-gallon buckets
- Drums
- Marking pen for labeling drums
- Wrench for opening/sealing drums
- Garden hose, minimum length 25 feet
- Appropriate PPE
- Camera (Optional)

3.0 PROCEDURES

1. Identify applicable components of the drinking water system between the wellhead and the point to be sampled. Observe the location(s) of exterior faucets, piping, pressure tank(s), water softener, filtration system, or multiple wells that may be connected/plumbed. Record in the site logbook a sketch of the system from the wellhead to the point the system enters the structure. If one or more points inside the structure are to be purged and sampled, extend the sketch to the point(s) sampled.

2. Locate the tap or faucet which is at, or nearest, to the wellhead (i.e., optimally prior to a water softener and/or filtration system) for purging and subsequent sample collection.

3. Record in the site logbook the location of the tap or faucet to be used for purging and sampling.

4. Calibrate the field parameter instruments in accordance with SOP 7.5 (Measurement of Field Parameters), or in accordance with manufacturer's specifications.

5. If the purge water is to be discharged onto the ground directly from the tap or faucet, determine if the purging will cause water to pool near the wellhead. If unsafe working conditions or damage to property could be caused by the purge water, attach one end of a garden hose to the faucet. Then, position the other end of the hose so that the purge water will safely drain away from the work area.

6. If the purge water is to be discharged into a 5-gallon bucket or drum, attach one end of the garden hose to the faucet. Then, position the other end of the hose so that the purge water will flow into the bucket or drum.

7. Open the tap or faucet so that the water flows at a high rate. Record the time that the purging begins in the field data sheet and the site logbook.

8. After the water has flowed for at least 15 minutes (or when the calculated purge volume has been achieved), collect measurements of pH, conductivity and temperature. Measurements of dissolved oxygen (DO), turbidity, oxidation reduction potential (ORP), or other parameters may be collected based on the approved site Field Sampling Plan or site-specific criteria. Collect all measurements in accordance with SOP 7.5 (Measurement of Field Parameters). Record the measurement collection time in the field data sheet and the site logbook.

9. While the water continues to flow, record field parameter measurements at intervals of no less than 5 minutes. Continue this procedure until three (3) consecutive measurements are consistent within the following specific tolerance limits:

pH	+/-0.5	(required)
conductivity	+/-10%	(required)
temperature	+/-0.5°C	(required)
dissolved oxygen	+/- 0.3 mg/L	
turbidity	+/-10% (> 10NTU)	
ORP	+/-10mV	

If field parameters have not stabilized after 3 successive readings (or, when the calculated well volume has been achieved), continue taking measurements at 3 minute intervals up to a maximum of 5 successive readings. If, after 5 successive readings, the parameters have not stabilized, an entry shall be made in the field logbook indicating that sampling will be conducted even though the field parameters are outside the specified tolerance limits.

10. Reduce the flow of water to disconnect the hose prior to sampling. Do not shut off the flow while disconnecting the hose.

11. Collect samples as described in SOP 7.10 (Sampling a Drinking Water Well) or in accordance with the approved site Field Sampling Plan.

12. Shut off the water.

13. If purge waters have been collected for disposal, store and dispose of the purge waters in accordance with SOP 1.4 (Management of Investigative Derived Waste).

4.0 CAUTIONS AND INTERFERENCES

The primary goal in performing groundwater sampling is to obtain a representative sample of the water bearing unit. Samples collected for analysis can be compromised in the field by: (1) taking an unrepresentative sample, (2) handling the sample incorrectly, and/or (3) introducing foreign contaminants into the sample. Sample integrity can be optimized by following appropriate sampling protocol(s) and utilizing trained field personnel.

This purging procedure is intended for wells with a sealed wellhead. Do not open sealed wellheads.

TCEQ

STANDARD OPERATING PROCEDURE NO. 7.10
SAMPLING A DRINKING WATER WELL

12/13/07

Alan Batcheller, Director **Date**
Remediation Division

1.0 METHOD SUMMARY

The objective of this standard operating procedure (SOP) is to provide guidance for the sampling of a drinking water well. Drinking water wells are sampled to determine the potential risk to human health and/or characterize the nature and extent of groundwater contamination. Drinking water wells typically have a sealed wellhead which prevents sampling directly at the wellhead. To collect a representative sample from the water well, use the tap or faucet located at, or nearest, to the wellhead. Using the tap or faucet, purge the well in accordance with SOP 7.9 (Purging a Drinking Water Well). Once the well is purged, collect the groundwater sample using a clean sample container which is appropriate for the intended analysis. During the sampling event, complete a field data sheet, and enter pertinent information and observations into the site logbook.

1.1 ASSOCIATED SOPS

SOP 6.1 (Field Activity Documentation and Reporting)
SOP 6.3 (Collection of VOC Samples)
SOP 6.4 (Sample Handling and Control)
SOP 6.5 (Collection of QA/QC Samples)
SOP 7.7 (Groundwater Sampling Using a Pump)
SOP 7.9 (Purging a Drinking Water Well)

2.0 EQUIPMENT/APPARATUS/REAGENTS

The following is a list of equipment typically used for sampling a drinking water well.

- Site logbook
- Field data sheet
- Chain of custody forms
- Custody seals
- Sample containers/ cooler
- Sample preservatives (if sample aliquots are not pre-preserved)
- Sample container labels
- Shipping containers

- Ice
- Ziploc-type plastic bags
- Packing material
- Appropriate PPE
- Disposable gloves
- Camera (optional)

3.0 PROCEDURES

1. Refer to SOPs 6.1 (Field Activity Documentation and Reporting), 6.3 (Collection of VOC Samples), 6.4 (Sample Handling and Control), 6.5 (Collection of QA/QC Samples), the approved site Field Sampling Plan, and the project Quality Assurance Project Plan (QAPP).

2. Purge the well in accordance with SOP 7.9 (Purging a Drinking Water Well).

3. Label the appropriate sample aliquots in accordance with SOP 6.4 (Sample Handling and Control).

4. Reduce the flow of water to prevent the formation of air bubbles in the sample container during sample collection.

5. Sample aliquots should be collected in the following order (as applicable):

   - Volatile organic compounds (VOCs)
   - Semivolatile organic compounds (SVOCs); including polyaromatic hydrocarbons (PAHs)
   - Inorganic constituents (metals)
   - Inorganic constituents (water quality parameters; cations/anions)
   - Mercury
   - Cyanide
   - Total organic carbon (TOC)
   - Samples requiring field filtration
   - Samples for field parameter measurement
   - Samples for nutrient anion determinations

6. Filter (if applicable) and preserve samples in accordance with the approved site Field Sampling Plan. Do not preserve samples if the sample containers were preserved by the laboratory.

7. Fill the appropriate sample aliquots. For VOC samples, the sample aliquots should be filled to the top of the container so a meniscus is formed (SOP 6.3 Collection of VOC Samples). Avoid contact between the sample container and the faucet.

8. Carefully and quickly screw the cap onto the sample container and finger tighten.

9. Collect the appropriate QA/QC samples in accordance with SOP 6.5 (Collection of QA/QC Samples), or as required by the approved site Field Sampling Plan.

10. Complete the sample label information in accordance with SOP 6.4 (Sample Handling and Control) and place the labeled sample aliquots in a pre-chilled cooler.

11. Shut off the water.

12. Document the sample collection in accordance with SOP 6.1 (Field Activity Documentation and Reporting).

13. Complete the chain-of-custody form in accordance with SOP 6.4 (Sample Handling and Control).

14. Package all samples and paperwork in a shipping container in accordance with SOP 6.4 (Sample Handling and Control).

15. Transport or ship the sample container(s) to the analytical laboratory.

16. Restore the site following the applicable portions of SOP 1.3 (Site Restoration).

4.0 CAUTIONS AND INTERFERENCES

The primary goal in performing groundwater sampling is to obtain a representative sample of the water bearing unit. Samples collected for analysis can be compromised in the field by: (1) taking an unrepresentative sample, (2) handling the sample incorrectly, and/or (3) introducing foreign contaminants into the sample. Sample integrity can be optimized by following appropriate sampling protocol(s) and utilizing trained field personnel.

Wells should be sampled as soon as possible after purging and should be sampled in order from least contaminated to most contaminated or from upgradient to downgradient if the chemistry is unknown.